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THE MARINE OBSERVER

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VOL. 58 **No. 301** **JULY 1988**

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COVER PHOTOGRAPH taken by Mr R.N. Amery, 2nd Officer, f.p.v. *Falklands Desire*, South Atlantic, 22 November 1987, and reproduced by permission of J. Marr (Shipping) Limited. (See page 128).

Letters to the Editor, and books for review, should be sent to the Editor, The Marine Observer, Meteorological Office, Eastern Road, Bracknell, Berkshire RG12 2UR

LONDON: HER MAJESTY'S STATIONERY OFFICE

EXCELLENT AWARDS 1987

Assessment and selection of the 1,086 meteorological logbooks received from Selected Ships and Offshore units during 1987 have once again presented the Nautical Officers of the Marine Division with the difficult task of choosing those deserving of Excellent Awards. The final selection of the 100 Masters, Principal Observers and Radio Officers is shown on the following pages and takes into account the various factors which affect different ships' abilities to maintain effective and coherent meteorological observations and records.

The following ships achieved the six highest assessments:

1. m.v. *Devonshire* (Bibby Line Ltd), Captain M.R. Nisbet.
2. m.v. *Wellington Star* (Blue Star Ship Management Ltd), 3 logs from Captains P. Mathews, D.A. Ganderton and T.C. Black.
3. m.v. *Tolaga Bay* (P. & O. Containers Ltd), 2 logs from Captain J.C. Cox.
   m.v. *ACT 7* (Blue Star Ship Management Ltd), Captain R. Brownbill.
4. m.v. *Willowbank* (Bank Line Ltd), Captain P.J. Elder.
   m.v. *Strathbrora* (P. & O. Containers Ltd), 2 logs from Captains R. Brinkworth and J.S. Thorpe.
   m.v. *ACT 1* (Blue Star Ship Management Ltd), Captain G. Stubbings.
5. m.v. *Encounter Bay* (P. & O. Containers Ltd), Captain D. Robertson.
   m.v. *La Pampa* (Buries Markes Ship Management Ltd), Captain D.K. Smith.
   m.v. *Churchill* (Blue Star Ship Management Ltd), Captain N.D.T. Johnson.
6. R.R.S. *Bransfield* (British Antarctic Survey), Captain S.J. Lawrence.
   m.v. *Remuera Bay* (P. & O. Containers Ltd), Captain W.C. Carruthers.
   m.v. *Melampus* (Ocean Fleets Ltd), Captain M.J. Knight.

Congratulations are due to Blue Star for having 4 ships in the short list, and the same for P. & O. Containers. Special mention must be made of the efforts of Third Officer Mr Peter J. Neve, who sent in several expertly compiled catalogues of birds and cetacea observed in logs from *Wellington Star* and from *ACT 7*, in addition to continuous observational records. The *ACT 7* appears in the list for the seventh year running.

EXCELLENT AWARDS (Year ended 31 December 1987)

Captain	Company
P.M. Anthony	Bank Line Ltd
T.O.M. Armstrong	Ropner Management Ltd
A.M. Barker	P. & O. Containers Ltd
D.L. Beveridge	Dept of Agr. & Fish. for Scotland
T.C. Black	Blue Star Ship Management Ltd
J.K. Blackburn	P. & O. Containers Ltd
D.C. Blackman	P. & O. Containers Ltd
M.B. Bradley	Ropner Management Ltd
R. Brinkworth	P. & O. Containers Ltd
R. Brownbill	Blue Star Ship Management Ltd
H. Campbell	Caledonian MacBrayne Ltd
W.C. Carruthers	P. & O. Containers Ltd
B.V. Chipperfield	P. & O. Containers Ltd
A.J. Chivers	Blue Star Ship Management Ltd
P.J. Clark	P. & O. Containers Ltd
A.J. Clarke	Zapata Marine Service Ltd
M.J. Cole	British Antarctic Survey
V. Cook	P. & O. Lines Ltd
J.A. Corcoran	Bibby Line Ltd
J. Cosker	P. & O. Containers Ltd
G.W. Cowan	Caledonian MacBrayne Ltd
J.C. Cox	P. & O. Containers Ltd
A.G. Cruikshank	C.I. Shipping Ltd
R.D. Dinnie	P. & O. Containers Ltd
D.A. Dornom	P. & O. Containers Ltd
J.L.W. Dwight	B.P. Shipping Ltd
P.C. Dyer	Zapata Marine Service Ltd
M.P. Easton	B.P. Petroleum Development Ltd
P.J. Elder	Bank Line Ltd
C.R. Elliott	British Antarctic Survey

Captain	Company
A.J. Fee	P. & O. Containers Ltd
A.T. Ferrier	Caledonian MacBrayne Ltd
R.N. Firth	Shell Ship Management Ltd
S.R. Ford	Bank Line Ltd
J.R. French	Ministry of Agriculture, Fisheries & Food
D.A. Ganderton	Blue Star Ship Management Ltd
M.R. Godfrey	P. & O. Ferries Ltd
D.V. Harradine	P. & O. Containers Ltd
C.A. Hatcher	Myhre Havtor (U.K.) Ltd
E.M. Holmyard	Idwal Williams Co. Ltd
J.H. Hutson	P. & O. Containers Ltd
C. Jackson	Blue Star Ship Management Ltd
N.D.T. Johnson	Blue Star Ship Management Ltd
P.N. Johnson	B.P. Shipping Ltd
D.J.G. Kain	Shell U.K. Ltd
M.J. Knight	Ocean Fleets Ltd
R. Lanz	B.P. Petroleum Development Ltd
S.J. Lawrence	British Antarctic Survey
A.J. Leslie	P. & O. Containers Ltd
D.J. Lloyd	Denholm (I.O.M.) Ltd
S.S. Lockhart	Dept of Agr. & Fish. for Scotland
B. Luke	P. & O. Ferries Ltd
H.A. Mackenzie	Dept of Agr. & Fish. for Scotland
I.M. Maden	Bank Line Ltd
P.J.R. Manson	P. & O. Containers Ltd
P. Mathews	Blue Star Ship Management Ltd
M.L. Miller	James Fisher & Sons P.L.C.
A.J. Montgomerie	Jebsens Ship Management Ltd
P. Moore	Canadian Pacific Steamships Ltd
D.B.C. Morris	P. & O. Containers Ltd

Excellent Awards (*contd*)

Captain	Company	Captain	Company
D. Munro	Caledonian MacBrayne Ltd	E.D. Somes	Ocean Fleets Ltd
D. Newlin	Blue Star Ship Management Ltd	G. Stubbings	Blue Star Ship Management Ltd
M.R. Nisbet	Bibby Line Ltd	R.B. Tarbuck	London & Overseas Freighters P.L.C.
T.T. Nixon	B.P. Shipping Ltd	C. Thomson	Jebsens Ship Management Ltd
G.S. Oakley	Canadian Pacific Steamships Ltd	J.D. Thomson	P. & O. Containers Ltd
A.B. Osborne	Bank Line Ltd	J.S. Thorpe	P. & O. Containers Ltd
A.J. Palmer	P. & O. Containers Ltd	S.T. Waite	P. & O. Ferries Ltd
E.M.S. Phelps	British Antarctic Survey	J.M. Waller	Buries Markes (Ship Management) Ltd
R.H. Plant	P. & O. Ferries Ltd	J.B. Watson	Cunard Shipping Services Ltd
A.A. Railton	P. & O. Containers Ltd	T.L. Watson	P. & O. Containers Ltd
D.L. Rattray	Dept of Agr. & Fish. for Scotland	J.W. Welch	P. & O. Containers Ltd
D.J. Robertson	P. & O. Containers Ltd	R.A. Whistler	Furness Withy (Shipping) Ltd
H.A. Ross	Canadian Pacific Steamships Ltd	L.M. Wigmore	Gardline Shipping Ltd
D.J. Rouse	Souter Shipping Ltd	R.T. Wood	P. & O. Containers Ltd
C.R. Short	P. & O. Containers Ltd	I. Woodier	Bolton Maritime Management Ltd
P. Simpson	Bank Line Ltd	D.H. Worrin	Britship (I.O.M.) Ltd
D.K. Smith	Buries Markes (Ship Management) Ltd	F.H. Yeulett	C.I. Shipping Ltd
E.C. Smith	Blue Star Ship Management Ltd	P.G. Young	Ocean Fleets Ltd
S. Smith	Carisbrooke Shipping Ltd		

Principal Observing Officer	Company	Principal Observing Officer	Company
G.J. Andrews	Ocean Fleets Ltd	I.J. Hockin	Beta Maritime Services Ltd
G.R. Armstrong	Bank Line Ltd	M. Hooson	Zapata Marine Service Ltd
J.M.G. Arthur	Shell U.K. Ltd	I.D. Howard	Ocean Fleets Ltd
S.J. Attrill	Bank Line Ltd	M.J. Hume	Bibby Line Ltd

D.J. Ayling	Jebsens Ship Management Ltd
J. Barkess	Dept of Agr. & Fish. for Scotland
M. Barraclough	P. & O. Containers Ltd
S. Barraclough	P. & O. Containers Ltd
C.A. Bates	Buries Markes (Ship Management) Ltd
M.N. Baxter	Ocean Fleets Ltd
A.D. Broad	Shell Ship Management Ltd
N.D.J. Butler	Blue Star Ship Management Ltd
D.G. Carchrie	Caledonian MacBrayne Ltd
M.J. Catt	Britship (I.O.M) Ltd
I.M. Chadney	P. & O. Containers Ltd
I.G. Chadwick	B.P. Petroleum Development Ltd
B.A. Chapman	Ministry of Agriculture Fisheries & Food
M.J. Chapman	P. & O. Containers Ltd
T.D. Childs	Gardline Shipping Ltd
G.S. Colenutt	Blue Star Ship Management Ltd
H.J. Conlon	B.P. Shipping Ltd
N.W. Conquest	Jebsens Ship Management Ltd
R.J. Curry	P. & O. Containers Ltd
R.I. Cuthbert	James Fisher & Sons P.L.C.
G.P. Dawson	P. & O. Ferries Ltd
S.G. Dougal	Cunard Shipping Services Ltd
J.P. Dunne	B.P. Shipping Ltd
R.W. Eacott	Idwal Williams Co. Ltd
M. Ellis	Blue Star Ship Management Ltd
N.E. Gardiner	P. & O. Containers Ltd
A.J. Gorringe	P. & O. Ferries Ltd
M.R. Gover	Idwal Williams Co. Ltd
N.D. Gregory	Canadian Pacific Steamships Ltd
R.K. Harding	Bolton Maritime Management Ltd
D. Harnett	Canadian Pacific Steamships Ltd
J.R. Harper	British Antarctic Survey
M.J. Hawkes	Carisbrooke Shipping Ltd
R.I. Hay	C.I. Shipping Ltd
A.R. Hellyer	Ropner Management Ltd
J.W. Hepburn	Dept of Agr. & Fish. for Scotland
I.M. Hill	P. & O. Containers Ltd
S.J. Hutty	Canadian Pacific Steamships Ltd
N. Jones	Caledonian MacBrayne Ltd
N.C. Jones	P. & O. Containers Ltd
A.M. Leech	P. & O. Containers Ltd
P.J. Lightfoot	Ropner Management Ltd
R.E.D. Liley	C.I. Shipping Ltd
M.C. Littlewood	London & Overseas Freighters P.L.C.
W.T.D. Lunn	Souter Shipping Ltd
I. Macintosh	P. & O. Lines Ltd
K.S. MacKechnie	Denholm (I.O.M.) Ltd
C. McCulloch	Blue Star Ship Management Ltd
R.W. Madden	P. & O. Ferries Ltd
P.V. Marshall	Furness Withy (Shipping) Ltd
G.D. Mead	P. & O. Containers Ltd
J.P. Meade	P. & O. Containers Ltd
C.R. Merry	P. & O. Containers Ltd
C.W. Milne	Jebsens Ship Management Ltd
K.H. Milne	Esso Petroleum Co. Ltd
N.D.R. Copeman-Mitchell	P. & O. Containers Ltd
K.P. Mowat	Bank Line Ltd
E.V. Neale	Canadian Pacific Steamships Ltd
P.J. Neve	Blue Star Ship Management Ltd
R.G.C. Noble	Ben Line Steamers Ltd
I.S. Norris	P. & O. Containers Ltd
D.A. Parsons	P. & O. Ferries Ltd
N.J. Pengelly	B.P. Petroleum Development Ltd
C.J. Petty	P. & O. Containers Ltd
C.R. Pratt	Myhre Havtor (U.K.) Ltd
D. Pritchard	Wallem S.M.S. (I.O.M.) Ltd
J.W. Renson	Gardline Shipping Ltd
G.A. Hoe-Richardson	Blue Star Ship Management Ltd
P.C. Sarjeant	British Antarctic Survey
N. Sheard	Zapata Marine Service Ltd
R.J. Sheldon	Dept of Agr. & Fish. for Scotland
P.S. Sinclair	Blue Star Ship Management Ltd
A. Stangroom	Bank Line Ltd
W.J. Stoker	P. & O. Containers Ltd

Excellent Awards (*contd*)

Principal Observing Officer	Company	Principal Observing Officer	Company
R.H.N. Stone	B.P. Shipping Ltd	S.P. Weston	B.P. Shipping Ltd
M.C.P. Sutcliffe	P. & O. Containers Ltd	D.C. Collins-Williams	P. & O. Containers Ltd
I. Thomas	Ocean Fleets Ltd	R.P. Williams	Britship (I.O.M.) Ltd
P.A. Trafford	P. & O. Containers Ltd	T.G. Wilson	Caledonian MacBrayne Ltd
M.G. Vanstone	Furness Withy (Shipping) Ltd	N.P. Woodhead	P. & O. Containers Ltd
S.L.J. Walker	Bibby Line Ltd	A.M. Woods	P. & O. Containers Ltd
B.C. Watkins	London & Overseas Freighters P.L.C.	A.W. Wortley	P. & O. Containers Ltd
D.T. Wells	Bank Line Ltd		

Radio Officer	Company	Radio Officer	Company
D.K. Alcock	P. & O. Containers Ltd	R.J. Macdonald	Marconi International Marine Co. Ltd
N.A. Allison	Wallem S.M.S. (I.O.M.) Ltd	E. Mackenzie	P. & O. Containers Ltd
D.A. Armstrong*	Caledonian MacBrayne Ltd	A. Mackinnon	P. & O. Lines Ltd
W.T. Ashley	S.T. & C. International Marine Ltd	D.A.C. MacRae	S.T. & C. International Marine Ltd
G.E. Bailey	S.T. & C. International Marine Ltd	D.J. McCrohan	British Antarctic Survey
J. Baldwin	Wallem Hong Kong Ltd	J.A. McKay	P. & O. Containers Ltd
T. Baxter	S.T. & C. International Marine Ltd	I. McKendrick*	Dept of Agr. & Fish. for Scotland
D.W. Bone	Acomarit (U.K.) Ltd	P.A. Marson	B.P. Petroleum Development Ltd
S.J. Braithwaite	P. & O. Containers Ltd	N. Marwood	S.T. & C. International Marine Ltd
J. Bridge	P. & O. Containers Ltd	D.B. Millar	P. & O. Containers Ltd
S.O.J. Broady	Marconi International Marine Co. Ltd	M.F. Morgan	S.T. & C. International Marine Ltd
H.E. Brookfield	Marconi International Marine Co. Ltd	B.A. Mullan	P. & O. Containers Ltd
R. Buckles	Ocean Fleets Ltd	D. Neave	S.T. & C. International Marine Ltd
S.D. Buxton	British Antarctic Survey	J.H. Oliver	B.P. Tanker Co. Ltd

A. Campbell	... ...	C.I. Shipping Ltd
S.R. Cloutte	... ...	P. & O. Containers Ltd
A. Collins*	... ...	Dept of Agr. & Fish. for Scotland
M.E. Collins	... ...	Shell Tankers (U.K.) Ltd
R.F. Collins	... ...	S.T. & C. International Marine Ltd
C.Y. Constantinou	... ...	P. & O. Containers Ltd
P.G. Corkin	... ...	Furness Withy (Shipping) Ltd
J.R. Cowan	... ...	S.T. & C. International Marine Ltd
J.J. Coyle*	... ...	Ministry of Agriculture Fisheries & Food
B.G. Davies	... ...	Garth Shipping Co. Ltd
P.E. Davies	... ...	B.P. Shipping Ltd
C.A. Dillon	... ...	Marconi International Marine Co. Ltd
A.L. Dobson	... ...	Furness Withy (Shipping) Ltd
P.W. Ferguson	... ...	P. & O. Containers Ltd
D.S. Flemington	... ...	P. & O. Containers Ltd
D.W. Fletcher	... ...	C.I. Shipping Ltd
M.J.G. Garner*	... ...	Shell U.K. Ltd
K.J. Gaughan	... ...	P. & O. Containers Ltd
G.S. Graham	... ...	Furness Withy (Shipping) Ltd
K.R. Grattan	... ...	Radio & Electronic Services Ltd
T.J. Graves	... ...	Canadian Pacific Steamships Ltd
B.A. Hall*	... ...	Dept of Agr. & Fish. for Scotland
M.R.T. Hannan	... ...	P. & O. Containers Ltd
P. Hemmerman	... ...	Canadian Pacific Steamships Ltd
C.W. Hodgson	... ...	P. & O. Containers Ltd
S.C. Horne	... ...	P. & O. Ferries Ltd
D. Jakobaufderstroht	... ...	London & Overseas Freighters P.L.C.
M.J. Janor	... ...	S.T. & C. International Marine Ltd
K.R. Jones	... ...	B.P. Petroleum Development Ltd
C.L. Keeble	... ...	Marconi International Marine Co. Ltd
D.A. Kelsall	... ...	P. & O. Containers Ltd
G.C. Kemp	... ...	P. & O. Containers Ltd
R.C. Knott	... ...	S.T. & C. International Marine Ltd
D. Lawrence	... ...	London & Overseas Freighters P.L.C.
T.E. Lowe	... ...	Buries Markes (Ship Management) Ltd
J.G. Palethorpe	... ...	Bibby Line Ltd
A.J. Pampling	... ...	S.T. & C. International Marine Ltd
P.I. Pegg	... ...	P. & O. Containers Ltd
S.A. Potter	... ...	Electro-Nav International Ltd
J. Ramsay	... ...	S.T. & C. International Marine Ltd
Y. Rangarajan	... ...	Ocean Tramping Ltd
A.J. Rawlinson	... ...	Gardline Shipping Ltd
R.B. Redhead	... ...	P. & O. Containers Ltd
D.E. Reilly	... ...	E.B. Communications (G.B.) Ltd
T. Searle	... ...	P. & O. Containers Ltd
G.N. Shaw	... ...	S.T. & C. International Marine Ltd
S. Shayes	... ...	S.T. & C. International Marine Ltd
P.K. Short	... ...	Garth Shipping Co. Ltd
A. Sirkett	... ...	E.B. Communications (G.B.) Ltd
R.M. Slacke	... ...	Marconi International Marine Co. Ltd
N.R. Smirk	... ...	S.T. & C. International Marine Ltd
G. Smith	... ...	Quadrant Marine Services Ltd
T.J. Smith	... ...	P. & O. Containers Ltd
R. Stevens	... ...	Ocean Fleets Ltd
R. Stewart	... ...	P. & O. Ferries Ltd
G.O. Szymanski	... ...	Esso Petroleum Co. Ltd
J. Taylor	... ...	P. & O. Ferries Ltd
A.G. Thompson	... ...	P. & O. Lines Ltd
J.C. Thompson	... ...	P. & O. Containers Ltd
C.K. Thornalley	... ...	P. & O. Containers Ltd
T.D. Tims	... ...	Radio & Electronic Services Ltd
M.J. Tindall	... ...	Buries Markes (Ship Management) Ltd
A. Titley	... ...	P. & O. Containers Ltd
R. Wade	... ...	British Antarctic Survey
T.W. White*	... ...	Britship (I.O.M.) Ltd
R.E.J. Wicks	... ...	Marconi International Marine Co. Ltd
B. Wilkinson	... ...	P. & O. Containers Ltd
J.H. Williams	... ...	Wallem S.M.S. (I.O.M.) Ltd
R.A. Wilson	... ...	Curnow Shipping Ltd

* Deck Officer.

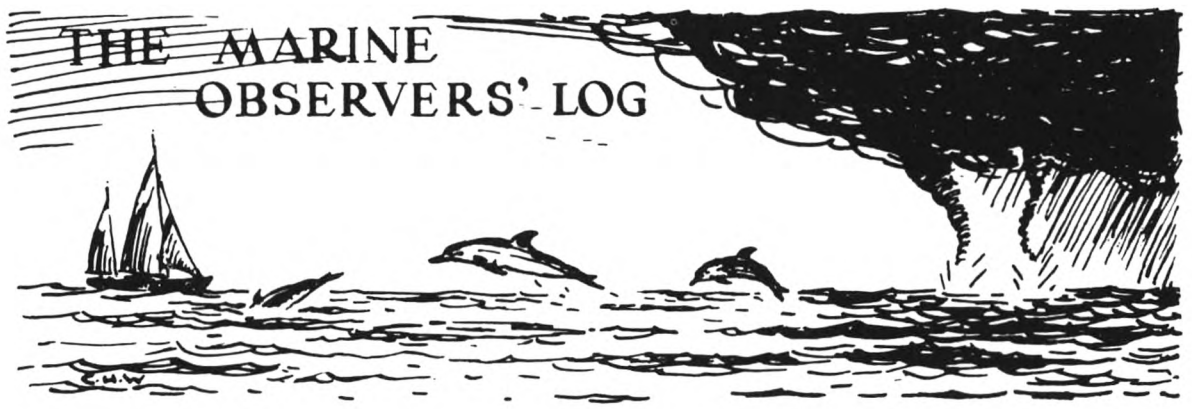
'MARID' SHIPS†

Captain	Principal Observing Officer	Radio Officer	Company
J. Davis	P. Eaton	A. Preece*	Esso Petroleum Co. Ltd
D.J. Mortimore	D.G. Mathias	R.J. Jenkins	Sealink (U.K.) Ltd
A.P. Shenton	K.M. Seery	P. Sumpton*	Rowbotham Tankships Ltd

* Deck Officer.

† Vessels recruited for the purpose of observing and transmitting sea temperatures with non-instrumental observations in the North Sea.

Note. Nominees for Excellent Awards should already have received notification of their nominations by post, but any officer named in the above lists who has not yet been contacted should write to the Marine Superintendent, Marine Division, Meteorological Office, Eastern Road, Bracknell, Berkshire RG12 2UR, with an address to which the award should be sent, or contact the Marine Division through a U.K. Port Met. Officer.



July, August, September

The Marine Observers' Log is a quarterly selection of observations of interest and value. The observations are derived from the logbooks of marine observers and from individual manuscripts. Responsibility for each observation rests with the contributor.

Observing officers are reminded that preserved samples of discoloured water, luminescent water, etc. considerably enhance the value of such an observation. Port Meteorological Officers in the U.K. will supply instructions on how to preserve and pack such samples on request.

FORMER TYPHOON 'WYNNE'

Western Pacific

m.v. *Tokyo Bay*. Captain J.M. Johnston. Nagoya to Tokyo. Observers: the Master and ship's company.

30–31 July 1987. Upon the vessel's arrival at Tokyo Bay Pilot at about 0600 GMT on the 30th, the Pilot boarded and informed the Master that the port was closed due to the imminent arrival of a severe tropical storm, formerly typhoon Wynne. Declining the use of the Tokyo Wan typhoon anchorage, the Master turned the vessel round and proceeded out to shelter behind the island of O Shima, approximately 10 n.mile from the Pilot station. On arriving off the island, the vessel was stopped at 0905, and secured in preparation for the worst.

During the course of the next few hours it became apparent that the expected bad weather was not going to materialize. The ship experienced winds not exceeding force 3, and no significant barometric tendency was observed. At about 2048, the vessel was informed that the port was re-opened and that it was to proceed to the Pilot station.

At 0118 on the 31st the vessel was secured alongside and cargo work commenced. Later, towering cumulus and cumulonimbus clouds were observed to be forming over the land in the direction of Tokyo, and at about 0600 the sky was completely overcast with dense cloud accompanied by frequent thunder and lightning. Ten minutes later the vessel encountered torrential rain with near gale-force winds, estimated at times to be at least force 7 and NE'ly. All cargo work was stopped and all hands were called out to tend moorings. By 0620 the worst of the storm had passed and the rain had ceased completely by 0630; the wind reverted to NE'ly, force 2, enabling the ship's company to stand down and cargo work to resume.

Position of ship: 34° 42′N, 139° 12′E.

TYPHOON 'DINAH'

Sea of Japan

m.v. *Tor Bay*. Captain M.J. Godbehear. Busan to Keelung. Observers: the Master, Mr K. Campbell, 1st Officer, Mr S. Barraclough, 2nd Officer, Mr N.E. Gardiner, 3rd Officer and ship's company.

30–31 August 1987. The ship sailed from Busan at 1100 GMT on the 30th, with Typhoon Dinah approximately 250 n.mile south-south-west of it, heading north-north-east at 20 knots.

It was deemed unwise to head directly for our next port of call, Keelung in Taiwan, as the intended track would have taken us very close to, if not through the centre of Dinah; so instead, we took the 'scenic' route.

As shown on the chart, we headed north-north-east on departure in an attempt to put as much distance between ourselves and Dinah, while also hoping that she would veer eastwards on passing Busan, enabling us to come about and set a course for Keelung. After all, you can't keep heading north in the Sea of Japan without hitting Russia.

The weather was logged hourly until Dinah had passed clear, and a selection of observations follow.

Date and time (GMT)		Wind Dir'n	Wind Force	Pressure (mb)	Distance from Dinah (by plot) (n.mile)
30th	1100	NE	3/4	1002.4	250
	1300	NE'N	7/8	999.9	230
	1400	NNE	7	998.9	210
	1500	NNE	7	994.2	205
	1600	NNE	8	990.4	190
	1700	NE'N	8	988.4	170
	1900	NE'N	8	986.8	140
	2000	NE'N	8/9	986.1	120
	2200	NNE	10/11	982.8	110
	2300	N'E	11/12	980.9	110
31st	0100	NNW	12	984.4	135
	0200	NNW	11/12	988.3	160

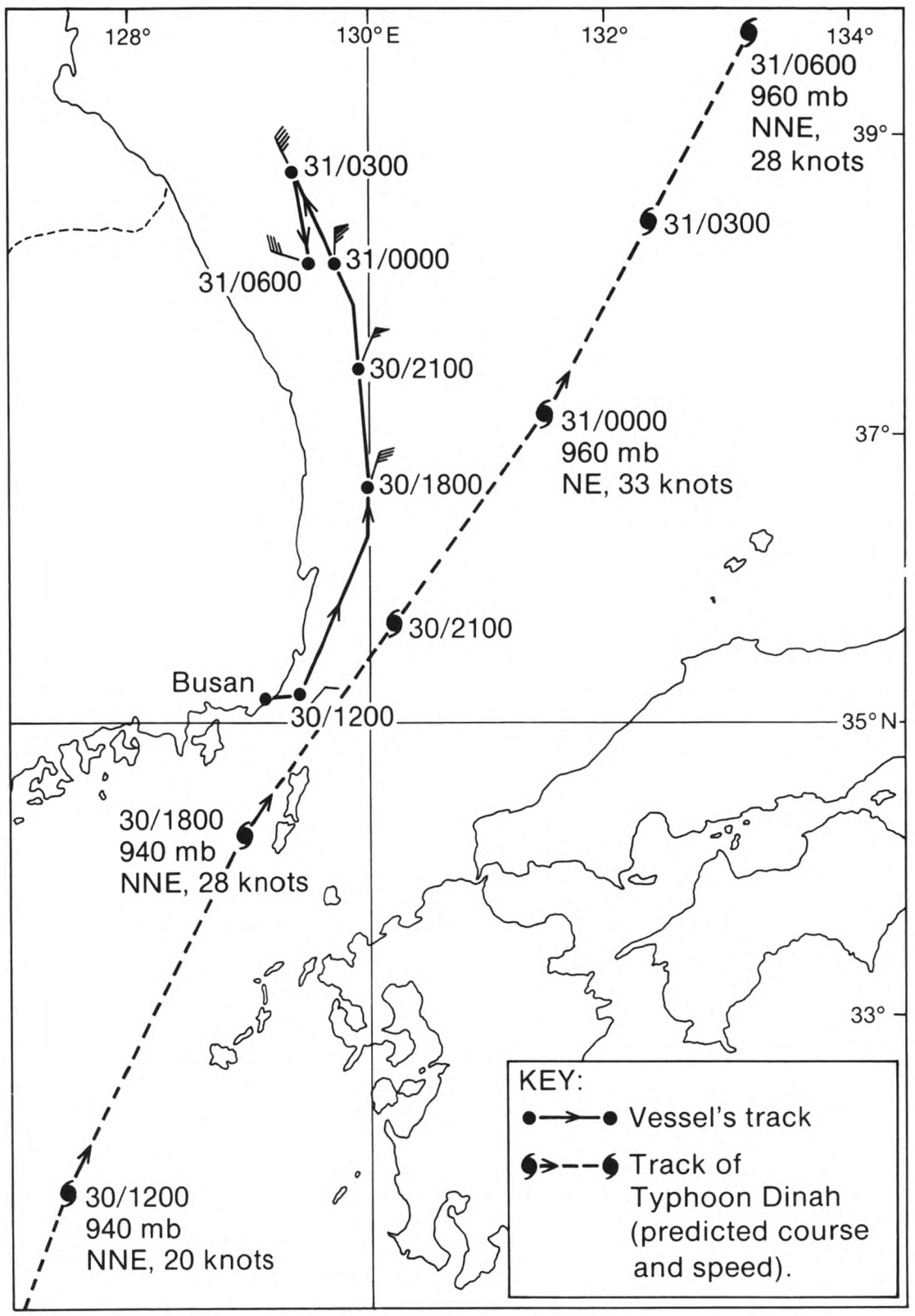
Heavy rain was encountered at frequent intervals, which, along with the driving spray severely reduced the visibility.

Throughout the passage, many vessels were seen on radar to be heading for the west coast of Korea in order to gain some shelter, although one small vessel was seen at 1330 heading east! Also throughout, a short heavy swell was running continually from the north-east, causing the vessel to roll and pitch heavily at times.

At 0300 on the 31st, we altered course to starboard onto a new heading of 162°, as the weather had eased. The next weather from Tokyo (0350) put Dinah 105 n.mile south-east of the ship at 0000, which was the closest she came. When we eventually came round, we had covered a distance of 244 n.mile in the wrong direction.

Position of ship at 1300 GMT on the 30th: 35° 12′N, 129° 36′E.

Position of ship at 0300 GMT on the 31st: 38° 42′N, 129° 22′E.



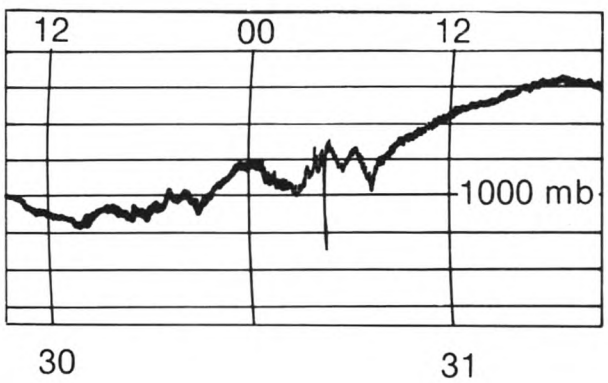
Note. Typhoon Dinah was forming on 21 August, east of Guam. It was given 'typhoon' status three days later when near 13° N, 136° E; at this time it was starting to recurve. On the 25th its maximum sustained winds were estimated to be 115 knots. Dinah was a supertyphoon by the 26th and lay between the Philippines and the Marianas Islands. The winds around the centre were 130 knots. The supertyphoon began to weaken in the East China Sea, but maintained typhoon intensity until the 31st. This storm brought hurricane strength winds and torrential rain to South Korea and left 12,000 people homeless in its wake.

SQUALL

Western Pacific

m.v. *Valdivia*. Captain N.C. Kerr. Long Beach to Sakaide. Observers: the Master and ship's company.

31 July 1987. At 0325 GMT whilst on a course of 151° a squall passed over the ship. At the time, the pressure was very unsteady with rapid variations, and tropical revolving storm 'Wynne' was approximately 150 n.mile north of the vessel. The wind was SW'ly, force 9–10, and the sea was very rough, with swells from 270° and 300°. As the squall passed, the wind gusted to 90 knots from the south-west, accompanied by torrential driving rain which reduced the visibility to 30 m. There was thunder and lightning very close to the ship, and as can be seen from the barograph trace, the pressure dropped from 1003 mb to 996 mb over a period of only 3–4 minutes, before climbing again to its original level.



The wind speed was such that the bridge window-wipers were unable to function and came to a halt, causing the electrical breakers to come out. Immediately following the squall, the wind dropped away to force 3–5 for a few minutes.

At 0400 the wind was SW'ly force 12, the pressure was 1001.8 mb and the sea was rough with heavy swells, while continuous torrential driving rain assisted in removing paint from the weather side of the funnel; there was still thunder and lightning, and the visibility was 50 m. From 0325 to 0512, the vessel experienced frequent squalls with constant torrential rain and rapid fluctuations in pressure. The rain stopped at 0512 and the sky began clearing from the west while the wind speed dropped to force 7.

At 0600 the wind was SW'ly, force 8–9, the sky continued clearing, and the wheel-house was pumped dry.

Position of ship at 0325 GMT: 29° 36'N, 143° 01'E.

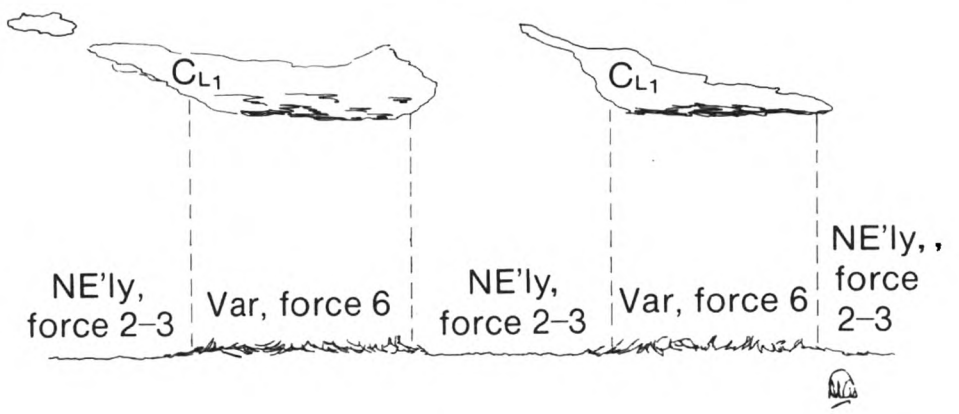
AGITATED WATER

North Atlantic Ocean

m.v. *Abbey*. Captain R.A. Whistler. Norfolk, Va. to Richards Bay. Observer: Mr M.G. Vanstone, 3rd Officer.

7 September 1987. At 1200 GMT small amounts of cumulus cloud with darkened bases and little vertical extent were observed around the vessel. The cloud base was estimated to be between 600 feet and 1,000 feet.

The wind at the vessel was NE'ly, force 2–3 and there was a low easterly swell. However, it was observed that under these clouds lay an area of very agitated water which indicated an apparent wind speed of force 6, of variable direction; numerous 'white horses' were also visible, see sketch. As the cloud formation moved on, the area behind became calmer with only occasional 'white horses', and the wind returned to NE'ly, force 2–3. At no time was any precipitation noted.



No apparent instrument changes were detected as the areas involved were small and their closest approach to the ship was 2 n.mile. No waterspout formation was observed, but it was assumed this phenomenon could have been one of the earlier stages in the development of a possible 'fair weather' waterspout.

At the time of observation the air temperature was 28.0 °C, wet bulb 24.0 sea 29.6, pressure 1014.1 mb.

Position of ship: 09° 54'N, 38° 18'W.

Note. Waterspouts are associated with clouds of great vertical extent, such as cumulonimbus, so it is unlikely that the clouds described in this report would have generated a true waterspout. However, there were obviously sufficient currents of air to enhance the observed wind speed and produce some turbulence at the sea surface as witnessed, but this agitation would probably have comprised the full extent of the phenomenon rather than the beginnings of something larger.

CLOUDS

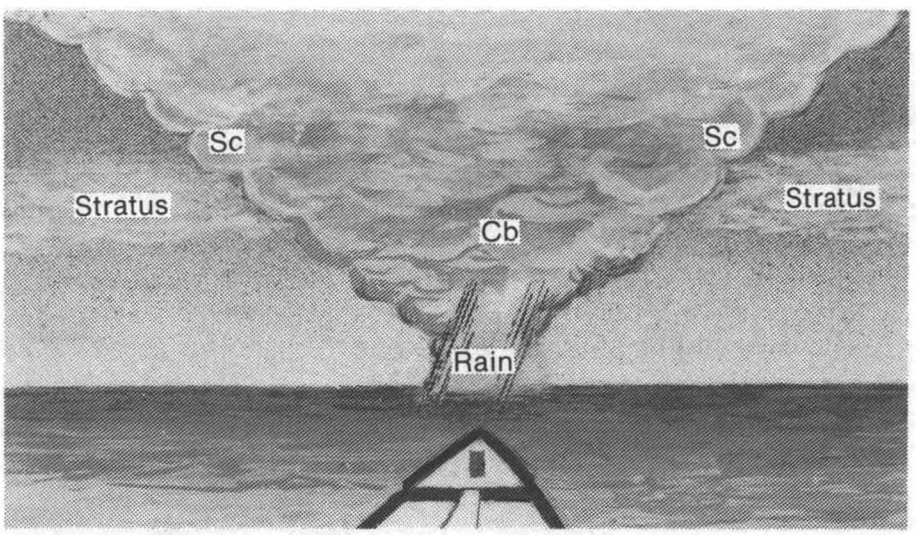
South Atlantic Ocean

m.v. *Stolt Stane*. Captain K.V. Lewis. Cape of Good Hope to Paranagua, Brazil. Observers: the Master, Mr P.A. Southworth, Chief Officer and Mr J.D. Elsdon, 3rd Officer.

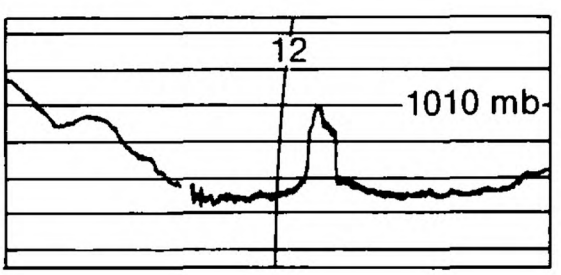
13 July 1987. At 1330 GMT the cloud formation shown in the sketch was observed. During the hours preceding the observation, the vessel had experienced a light, N'ly breeze, slowly backing to NW'ly over a period of about ten hours, and which was freshening as it backed. At the same time, the barograph trace had been falling somewhat unsteadily from a peak of about 1018 mb to a low of about 1004 mb, then levelling off. The sky had changed from patches of dense cirrus to a fairly featureless cirrostratus cover, further followed by an isolated broad band of cumulonimbus (without anvil) lining the horizon

ahead; rain was seen reaching the surface. In fact, all were typical signs of an approaching depression. At the same time, the Radio Officer reported abnormal VHF reception of about 400 n.mile.

At the time of observation with the ship heading approximately 315° at a speed of 15 knots, the wind backed very sharply from NW'ly to SSW'ly, and freshened from force 5 to about force 8, gusting to force 9. The shift in the wind also brought about a rise in the air temperature from 22.5 °C to 25. The appearance of the cumulonimbus cloud ahead became distinctly funnel-shaped with furled stratocumulus-type extremities as shown. Unfortunately, the observers were unable to photograph this unique formation, no one had ever seen the likes of it before.



Although this was obviously the approach of a depression, the behaviour of the barograph trace was beyond comprehension; the stylus leapt vertically for a full 5 mb in an instant. The funnel-shaped cloud became ragged, and engulfed all the sky visible from the vessel, accompanied by torrential driving rain. At 1340,



the wind veered a little to WSW'ly, and thunder and lightning was in evidence for a short period; then the wind moderated to force 5, and the temperature dropped as rapidly as it had risen, to 20.5. The barograph stylus was teetering at its new level, then dropped by about 1 mb at 1400, whilst the wind remained WSW'ly, force 5, with the temperature steady at 19.5. The wind veered again at 1430, and the cloud base was observed to be getting higher, whilst the temperature remained unchanged. At 1440, the wind was NW'ly, and the rain stopped, the cloud cover changed to altocumulus and altostratus, and the barograph trace dropped back to its pre-1330 level.

The observers came to the conclusion that they had passed just to the north of a centre of low pressure with occluded/occluding fronts. However, no matter how the course of the vessel through the diagram of a southern-latitude frontal depression was sketched, it was hard to explain the behaviour of the barograph.

Position of ship: 28° 12′S, 42° 02′W.

TIDE RIPS

South Pacific Ocean

m.v. *Discovery Bay*. Captain A.J. Fee. Long Beach to Auckland. Observers: Mr N.P. Woodhead, 3rd Officer and members of ship's company.

3 July 1987. Whilst on a course of 218°, at a speed of 17.5 knots, the vessel passed through three abnormal tide rips or currents, these being strong enough to deflect the ship from its course, and give an apparent drop in the sea temperature.

The first tidal rip was observed at 0025 GMT approximately 100 n.mile south of the Tonga islands. A white line was observed in the distance, stretching for several miles in a straight line. Upon approach, it was seen to be a line, about half a cable in width, of increasingly turbulent water, ending abruptly on its farther side where the water appeared relatively calm. As the ship passed through the disturbance, the bow was immediately deflected 3° to starboard. The tidal rip was observed to run between 140° and 320°. From successive satellite navigator fixes (automatic gyro input), the current appeared to increase to 104° × 1.3 knots just prior to the rip, and to become 326° × 0.9 knots just after it. Also noticed was a drop in the sea temperature. At 0000, a temperature of 24.0 °C had been recorded, whereas immediately after the disturbance it was 22.0 (by the sea bucket method). This was later confirmed with E.R. intake temperatures.

The second rip occurred twenty minutes after the first, running between 090° and 270°. This was far less marked, although it too deflected the ship's course by 1.5° to starboard. The third and last rip occurred at 0312; it was not as marked as the first, but was stronger than the second, and once again deflected the ship's bow by 2° to starboard. Sea temperatures were taken immediately before and immediately after passing through the final rip, and a drop from 21.5 to 20.5 was noted. The current calculated between successive satellite fixes appeared to shift from north-westerly at 1 knot after the first rip, to north-easterly at 1 knot before the final rip. The final current was observed to set 030° × 1.0 knot (between 0300 and 0600).

The wind throughout was S'ly, force 4, and the swell throughout was south-westerly with a period of 4 seconds and height 4 m. It should be mentioned that the echo sounder (reliable with a maximum recordable depth of 500 m) was switched on at the first sighting of the initial disturbance. No depth was recorded throughout.

Position of ship at 0025 GMT: 23° 07′S, 175° 32′W.

Position of ship at 0312 GMT: 23° 45′S, 176° 02′W.

Note. Mr J.B. Clark, of the Ocean Current section, Meteorological Office, comments.

'The tide rips occurred in an area where observations are few, and not a great deal is known about the current.

'However, the information available indicates that the phenomena observed were associated with

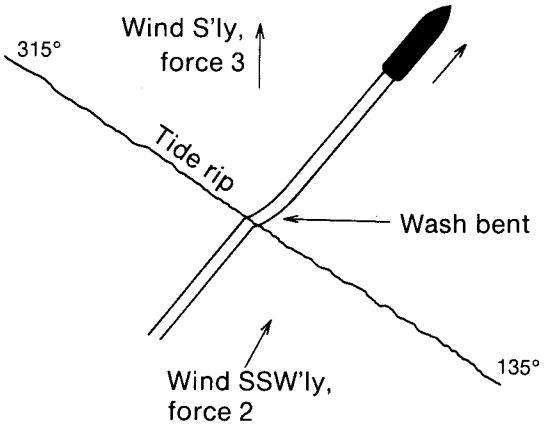
the boundary between the west-moving South Equatorial current and the east-going Southern Ocean current.

'It is at such boundaries that tide rips are likely to develop'.

m.v. *Willowbank*. Captain P.M. Anthony. Auckland to Oakland. Observers: Mr S.J. Attrill, 3rd Officer and Mr G.D. Bissett, Deck Cadet.

13 August 1987. At 2045 GMT the vessel on a course of 040° at a speed of 19 knots, passed through a tide rip which lay 135° to 315° for as far as could be seen in each direction. On the south-west side of the rip, the wind was a steady SSW'ly, force 2, with wind waves of period 1 second, height 0.5 m, whilst on the north-east side, the wind increased to force 3 and backed to S'ly, with wind waves of period 2 seconds and height 0.5–1 m.

Having passed through the rip and upon looking astern, the ship's wash was seen to set to the north-west on the south-west side of the rip, with the wash immediately on the north-east side being bent due to the changing rate of current, see sketch. After approximately 1 minute, the 'washes' were divided by about



25 m, indicating a difference of approximately 0.75 knots in the rate of currents.

Prior to passing through the rip, the vessel had been experiencing a current setting 330° × 0.9 knots, whereas after it, the current experienced became 270° × 0.3 knots, later increasing to 1 knot. An interesting observation was that of the change in sea temperature; at 1800 it was 23.4 °C, but after passing through the rip, at 2100 it was 25.7.

Position of ship: 16° 49'S, 167° 43'W.

CETACEA

North Sea

m.v. *British Security*. Captain D. Coombes. Tranmere to Klaipeda. Observers: the Master, Mr A. Holmes, Chief Officer, Mr J.R. Gibson, 2nd Officer, Mr G. Griffiths, SM1 and Mrs Coombes.

12 August 1987. At 1645 GMT, having passed an area of sea covered with seagulls, presumably attracted by some fishing vessels cleaning their nets by

Opposite page 108.

Photo. by D. Harnett

Falcon photographed on board m.v. *Fort Dufferin* (see page 113).

Photo. by P. Hemmerman

Jellyfish brought aboard m.v. *G. A. Walker* (see page 113).

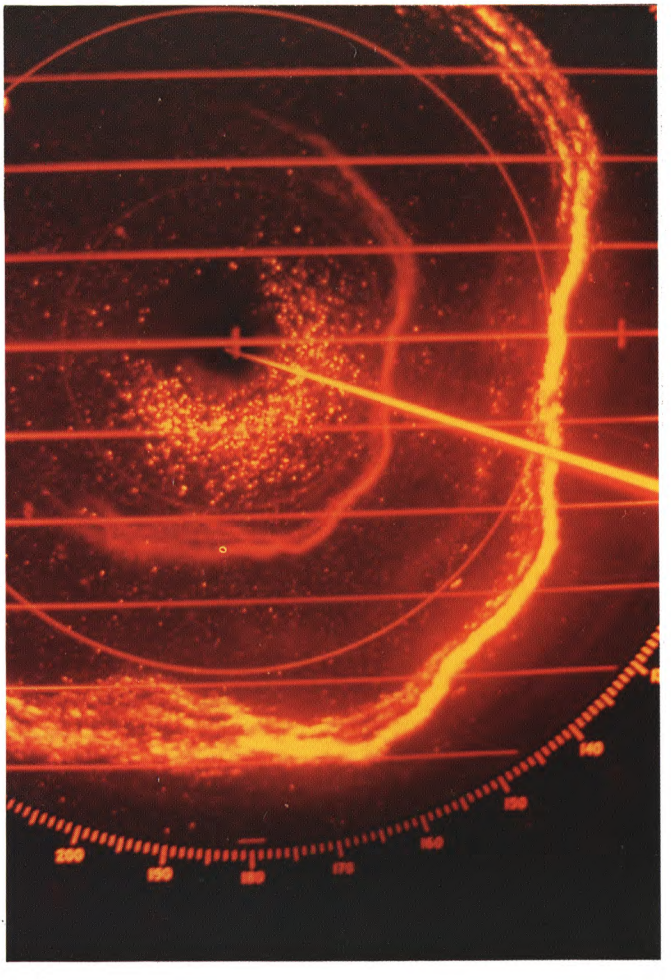


Figure 3
Radar anomaly as witnessed on South African research vessel *Africana* (see page 125).

Photo. by K. E. Denning

Opposite page 109.

Photo. by Skyfotos Ltd

Devonshire (Bibby Line Ltd) Captain M. R. Nisbet

Photo. courtesy Blue Star Ship Mgmt Ltd

Wellington Star (Blue Star Ship Management Ltd) Captain T.C. Black

Photo. by Fotoflite

Tolaga Bay (P. & O. Containers Ltd) Captain J. C. Cox

THREE OF THE SHIPS WHICH GAINED THE HIGHEST MARKS FOR THEIR METEOROLOGICAL LOGBOOKS DURING 1987 (see page 94).

circling, a 'blow' was sighted dead ahead at approximately 5 n.mile distant. No identification was possible at the time, and a close look-out was maintained for further blows.

Then a number of fins, blows and surface disturbances were noted. The fins were immediately identified as those of Killer Whales (*Orcinus orca*); the length and almost symmetrical shape of the fins being readily apparent. A number of whales were seen, between 10 and 20 in one group, containing both adults and juveniles. These passed down the port side, travelling in a north-westerly direction, about 1 n.mile off. When abeam, the 'saddle' of white/grey skin was seen on those individuals whose backs cleared the surface, and were observed on both the adult and younger (smaller) whales.

A smaller group of 3 whales passed close down the starboard side, separate from the main group. This one consisted of 2 adults escorting a young specimen in close formation. Their lengths were estimated at 8 m for the adults, and 4–5 m for the smaller ones. The white underside and backs were clearly visible.

Position of ship: 58° 08′N, 04° 38′E.

Note. Mr D.A. McBrearty, of the Dolphin Survey Project, University of Cambridge, comments:

'Killer Whales (*Orcinus orca*) may be seen around the British Isles at any time of the year although even at the optimum period of late summer, they are not a common sight in that anyone making half-a-dozen sightings per year in any major sea area of the British Isles would be fortunate indeed. Scottish water is certainly the most favourable area for sightings of this species where they tend to follow the salmon run to northern rivers'.

Mediterranean Sea

m.v. *Esso Demetia.* Captain K. Hebdon. Ceyhan (Turkey) to Marseille. Observer: Mr J.D. Peel, 3rd Officer.

27 August 1987. At 1000 GMT a small group of dolphins was sighted about 2.5 n.mile away, closing the starboard bow. The group was very active and travelling at speed, continually leaping clear of the water. The dolphins crossed the bow and reappeared about 0.5 n.mile on the port side.

As the main group passed astern, one individual turned and swam towards the stern, disappearing into the propellor wash. He reappeared, thankfully, and continued his little game of 'chase the prop' for about twenty minutes. Each time he came to the surface, a good clear view of him was presented.

He was about 3 m long, with a grey-blue topside and white undersides. There was a dorsal fin half-way along his back, the two pectoral fins at the sides. A longish snout matched the description in previous reports of a Spinner Dolphin.

After twenty minutes, he realised that he was going the wrong way, and turned back to rejoin the group of about twenty others.

Position of ship: 36° 14′N, 15° 19′E.

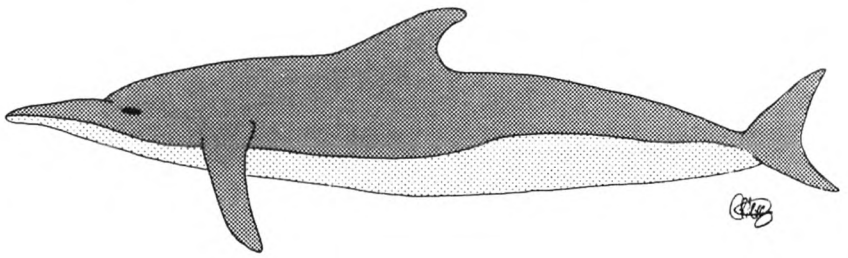
The Gulf

m.v. *Providence Bay.* Captain W.F. McCarthy. At anchor, Shuaiba. Observers: Mr S.N. Horne, 2nd Officer, Mr C.R. Merry, 3rd Officer and Mr S.R. Paine, 4th Officer.

1 September 1987 at 0730 GMT, 8 dolphins were observed swimming in close proximity to the ship. Of these, 2 were immature dolphins measuring

approximately 1.5 m in length. The adults were estimated to be about 2.0 m long.

As shown in the sketch, long snouts were noted, and both fins and flippers were pointed. The underbelly was a 'dirty' white, almost light grey in colour, and this increased in girth around the dolphins' flanks just behind the fin. They were



identified as Spinner Dolphins (*Stenella longirostris*). At no time during the observation were any acrobatics seen.

The sea temperature was taken, and gave a value of approximately 37.5 °C (off the scale of the thermometer); this was confirmed by a further sample taken on the other side of the ship. Was the dolphins' physical activity curbed by the presence of young, or would the extreme sea temperature make them somewhat lethargic?

Weather conditions at the time were: air temperature 36.8 °C, wet bulb 25.9, no wind, moderate visibility owing to haze.

Position of ship: 29° 03′N, 48° 16′E.

Note. Mr D.A. McBrearty comments:

'This certainly is a very high sea temperature, close to the dolphin's own body temperature, which is normally a little higher than that of man. Thermoregulation in dolphins is complex and adapted to a generally much cooler environment. Unlike terrestrial animals, dolphins have no sweat glands, and therefore can only loose heat by conduction through the blubber and skin into the surrounding sea. Cetaceans have a very special peripheral blood circulation to facilitate this heat loss. Dolphins also have a negative buoyancy and must keep swimming in order to come to the surface to breathe, thus adding more to an already high metabolic rate, as all metabolic activity produces heat. Where the temperature difference between dolphin and the surrounding sea-water is minimal, I would expect the animals to be not more active than is necessary to maintain all functions'.

m.v. *Staffordshire*. Captain R.A.F. Edwards. At anchor, Mina' al Ahmadi. Observers: Mr P.Ashurst, 3rd Officer and Mr M. Slater, Cargo Engineer.

26 September 1987. At 1930 GMT four dolphins were sighted close alongside the vessel, basking in the aura of the ship's deck lights. They then started chasing flying fish which must also have been attracted by the lights. The dolphins were probably the warm-water bottlenose type as they were about 3 m in length, with long slender beaks, and flippers which were curved back in line with the body. Their colour was slate grey on their backs, with lighter grey bellies, and without any distinguishable line markings on their sides.

They were seen to catch some of the flying fish before the fish could break the surface. When they caught the fish, the dolphins swam in a circle just below the surface of the water, remaining horizontal, but swimming on one side and

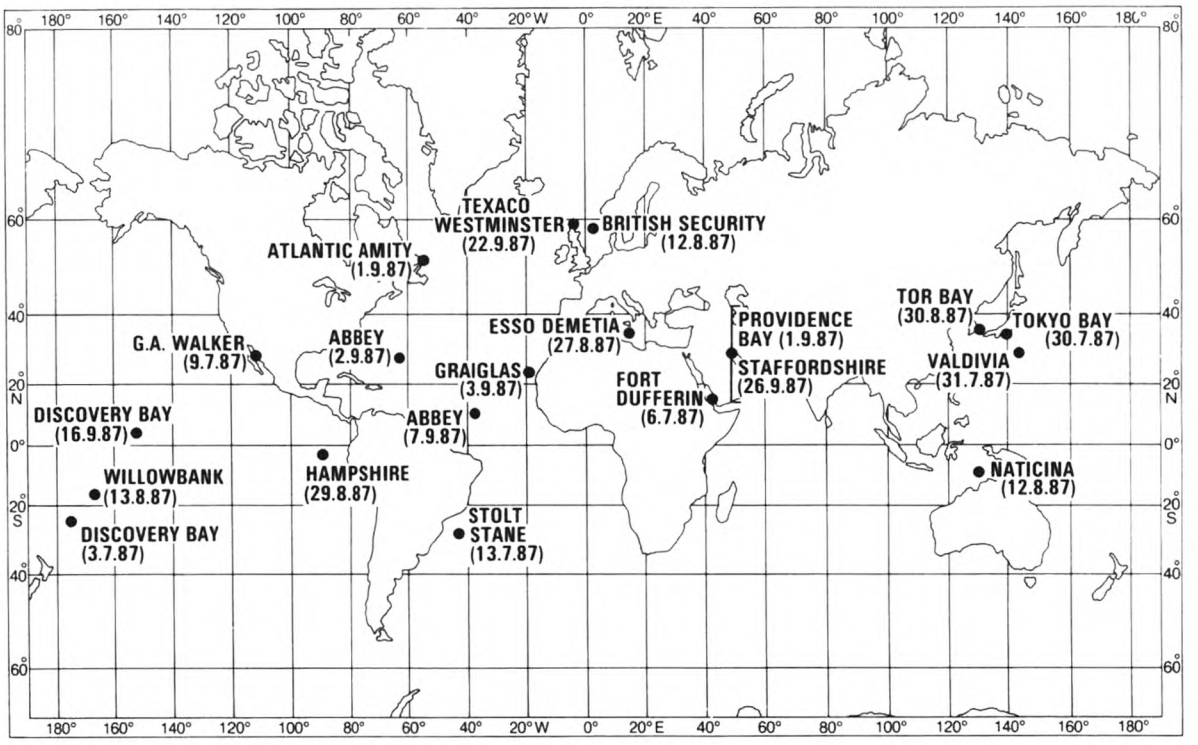
appearing to convulse from head to tail in order to swallow the fish. The sighting lasted for 15–20 minutes after which time neither dolphins nor flying fish were seen again.

At the time of observation the dry-bulb temperature was 33.6 °C, sea 32.5, there was a light breeze and the sea condition was slight.

Position of ship: 29° 04′N, 48° 12′E.

Note. Mr D.A. McBrearty comments:

'I think these were probably Humpback Dolphins (*Sousa chinensis*). They are found inshore in bays, anchorages and shallow seas from northern Australia, Indonesia, India, the Gulf and Red Sea. They have also been reported in the Bitter Lakes but not in the eastern Mediterranean. There is some variation in the shape of the dorsal fin and in the body colour pattern depending upon the geographical location of the specimen. They can be greyish or brownish with or without darker spots, to a creamy white with pinkish tips to the appendages. The common name is taken from the fibrous hump which is faired into the leading edge of the dorsal fin. A hump which is most noticeable on the African and South China Sea races, is less noticeable or almost absent on the Australian dolphins. There is also a related species (*S. teuszii*) to be found in the Atlantic Ocean off the coast of west Africa'.



Position of ships whose reports appear in *The Marine Observers' Log*

BAT

Arafura Sea

m.v. *Naticina*. Captain J.G. Ruffell. Whangarei to the Gulf. Observers: the Master, Mr D. Taylor, 2nd Officer, Mr P.J. Healy, 3rd Officer and Mr C. Gray, Chief Engineer Officer.

12 August 1987. At 0400 GMT a large bat was disturbed from its post, hanging on the lifeboat davits. It was mid-brown in colour, and had prominent cocked ears. The wing-span was estimated to be in the region of 60 cm.

It flew erratically around the vessel for about 15 minutes before coming to rest, hanging upside down on the fo'c'sle rails. Ten minutes later it was noted to have moved, and subsequent searching failed to reveal its location. The creature was thought to have been a fruit bat or flying fox.

Earlier in the voyage, the vessel had been to Port Moresby Pilot Station, and two days previously, had transitted the Torres Strait.

At the time of observation, the wind was E'S, force 4 and the cloud cover was 1 okta cumulus.

Position of ship: 09° 12'S, 130° 00'E.

Note. Mr J.E. Hill, of the Mammal Section, British Museum (Natural History), comments:

'This was certainly a fruit bat, probably the Small Flying Fox (*Pteropus hypomelanus*), which occurs throughout New Guinea and on many of the smaller adjacent islands. The fruit bats are usually strong fliers, and are quite likely to be encountered at sea between islands. They will often fly long distances to obtain ripe fruit'.

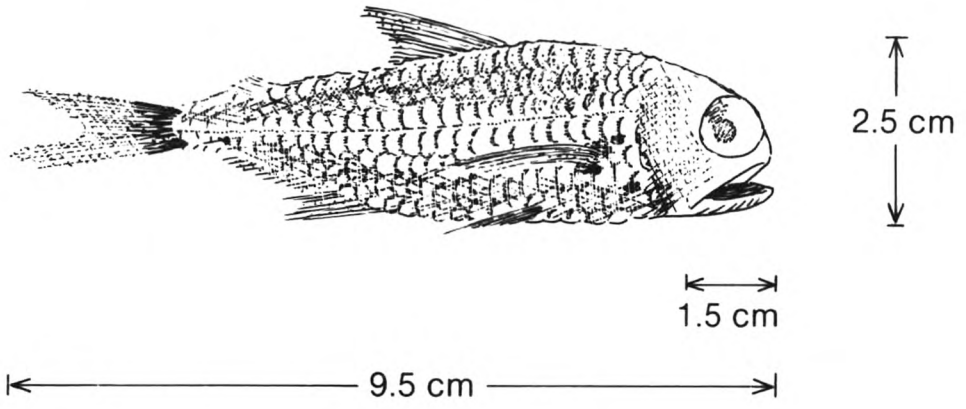
FISH

Eastern Pacific

m.v. *Hampshire*. Captain P.S. Bytheway. Westernport to Panama. Observers: the Master, Mr G.N. Penry, Chief Officer, Mr I. Cousins, 3rd Officer and Mrs Penry.

29 August 1987. At about 1130 GMT the Chief Officer brought to the bridge a small fish that he had found while working on deck.

As shown in the sketch, it was 9.5 cm long and 2.5 cm at its deepest point. It was blue-black in colour apart from the gills to the flanks, this area being turquoise-silver in colour.



Although small, the fish was most interesting because the visible part of each scale was about 3 mm long and 2 mm wide, and was serrated along its outer edge, so much so, that when a finger was run against them from tail to head, the fish would stick to the fingertip. The dorsal, side, bottom and tail fins were fan-shaped when opened out, and also had a serrated edge. The eyes were set into cavities in the head which were approximately 9 mm in diameter.

Position of ship: 03° 27'S, 89° 29'W.

JELLYFISH

Golfo de California

m.v. *G.A. Walker*. Captain G.S. Oakley. At anchor, Guaymas. Observers: Mr N.D. Gregory, 3rd Officer and Mr P. Hemmerman, Radio Officer.

9–16 July 1987. Whilst at anchor, large numbers of jellyfish were seen below the starboard bridge wing. A specimen brought up to the deck was closely observed, and identified as a blue rhizostome.

The bell was firm and rounded, and approximately 10 cm in diameter. For the most part it was mid-azure blue (see photograph opposite page 108), lightening slightly at the top. Around the fringe at the base of the bell were 8 large and 8 small, white oval patches, the large ones having a white central ridge which forked at the bottom. This lower section of the bell was speckled with small dark-blue spots.

The mouth parts were surrounded by a ring of sponge-like flesh, fringed with numerous small arms. The specimen had a small fish associated with it, which appeared to suffer from being in close contact with the jellyfish. After about 20 minutes the fish was trapped between the bell and the arms of the jellyfish, and was apparently lifeless. However, a few minutes later the fish was seen to revive and free itself. This reprieve was only short-lived, and the fish died soon afterwards.

Position of ship: 27° 52′N, 110° 50′W.

Note. Dr F. Evans, of the Dove Marine Laboratory, University of Newcastle upon Tyne, comments:

'The jellyfish has been identified by Dr S. Moore, of the British Museum (Natural History), London as *Stomolophus meleagris*. The species has been most commonly recorded in the warmer waters of the American continent, in both the Atlantic and the Pacific, but there are published records from the Galapagos Islands and Japan. In March 1985, the *Sea Princess* sent in a sighting from 03° N, 100° E, extending the known range some distance westwards from Japan.

'The colour is very variable; there is an underlying blue tint in the younger specimens, as seen in the excellent photograph, while older specimens may become creamy coloured with a deep chocolate-brown skirt, presenting a very different appearance'.

BIRDS

Red Sea

m.v. *Fort Dufferin*. Captain P. Moore. At anchor. Observers: the Master, Mr I. Hamilton, Chief Officer, Mr D. Harnett, 3rd Officer and Mr D. Minihane, Radio Officer.

6 July 1987. At about 0640 GMT, a bird of prey was sighted flying around the vessel, and then landing on the bridge wing wooden rail.

The bird had mottled brown colouring, as shown in the photograph opposite page 108, and was very alert to any movement. It became easily frightened, and when approached to about 2 m, it took fright and flew to the forward mast, but owing to men working there, it did not land. Instead, it landed on rails by the fo'c'sle.

At the time, the dry-bulb reading was 32.0 °C, the corrected pressure was 1005.0 mb, wind NW'ly, force 3.

Position of ship: 15° 50′N, 42° 04′E.

Note. Captain P.W.G. Chilman, of the Royal Naval Bird Watching Society, comments:

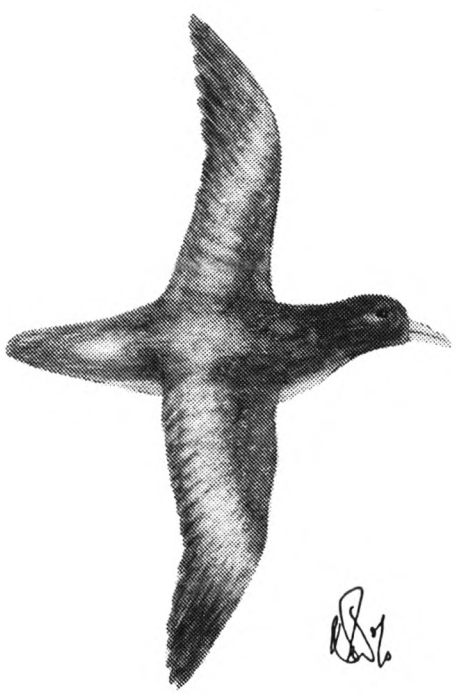
'I think that your bird is an immature Lanner Falcon (*Falco biarmicus*) although the facial stripe seems rather heavier than usual. A large falcon which breeds in Africa, Arabia and the near East, and uncommonly in southern Europe. Inhabits open country including deserts, usually nests on cliffs or rocky outcrops. Actively hunts birds and also takes small mammals and reptiles.'

Equatorial Pacific

m.v. *Discovery Bay*. Captain A.J. Fee. Auckland to Oakland. Observers: the Master, Mr N.P. Woodhead, 3rd Officer, Mr J. Lorimer, Chief Engineer Officer and Mr R. Jenkins, Watchman.

16 September 1987. At 2300 GMT several areas of disturbed, breaking water were observed which were not the same as the wind waves breaking; the wind at the time was ESE'ly, force 3. As the ship approached these areas, it appeared that they were in fact dense shoals of fairly large fish, and also amongst them were flocks of birds which were circling round the shoals and swooping down into them. Over the next 20 minutes, several more isolated shoals were observed, and at 2320, an area extending for perhaps 2 n.mile to starboard, 0.5 n.mile to port and which was 1 n.mile in length appeared to be 'boiling' vigorously. As the ship steamed through it, hundreds of fish could be seen swimming just below the surface. They were about 45–60 cm long and the area was probably filled with one huge shoal of them. The fish were not identified as they could not be seen clearly enough, but through their general shape, it was thought that they were tuna.

Up until this time few birds had been observed; the faithful albatrosses had disappeared when the wind died down four days previously, but there was still the occasional phalarope (possibly Wilson's Phalarope). Then all of a sudden, literally hundreds of birds appeared, one of which is shown in the sketch. They all



looked alike and were thought to be shearwaters, partly due to the way in which they were flying low over the waves, occasionally dipping the tips of their wings in the water. They were tube-nose birds, their plumage being various shades of brown, but from the ship's text-books, the markings were not compatible with drawings of individual shearwater species.

The wing tips and primary wing feathers were a very dark brown, as were the tail feathers, head, forepart of back and wings. However, across the back and wings was a crescent-shaped pale brown mottled patch, and there was also a distinctive paler patch on the rump. The beak was greyish and quite slender. As one bird was swooping down amongst the fish with its feet outstretched, its feet were noted to be a fleshy pink colour, and its underbody and undersides of the wings were a paler brown mottled colour, whilst the wings had dark edges. It was suspected that they were Christmas Shearwaters as the ship was some 200 n.mile north-east of Christmas Island, or Pale-footed Shearwaters; some of them stayed with the ship for the next 3 hours. Obviously, the fish were far too big a prey for the birds. However, both birds and fish were probably feeding on a much smaller fish which were not seen. All the observers claimed they had never seen a shoal of fish so big, and were surprised at the number of birds.

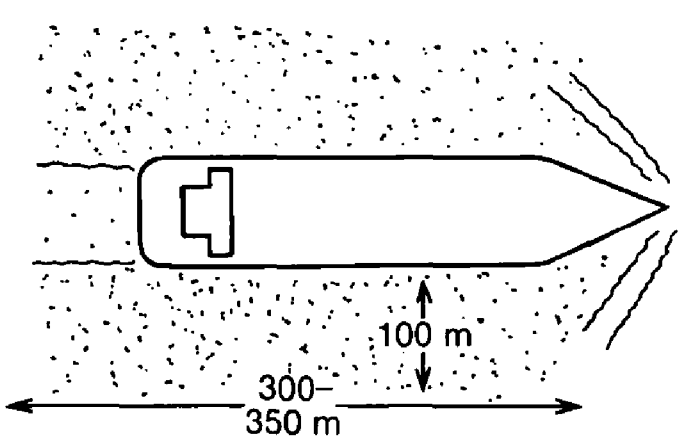
Position of ship: 03° 45'N, 153° 15'W.

BIOLUMINESCENCE

Eastern North Atlantic

m.v. *Graiglas*. Captain E.M. Holmyard. Moneypoint, Eire to Sepetiba Bay. Observers: Mr M.R. Gover, 2nd Officer and Mr O. Teixeira, A.B.

3 September 1987. Between 0244 GMT and 0315 GMT, in the sea along the length of the vessel and a little way aft, extending outwards for about 100 m on either side of the vessel, there could be seen thousands of 'explosions' of light, see sketch. The majority of explosions were very small pin-pricks of neon-blue light



about 5–10 cm in diameter. There were literally thousands of these occurring nearly continually. Intermingled with these were much larger but more sporadic 'big' explosions of light which seemed to start at depth, with a diameter of around 30 cm, then rapidly expanded and intensified at the same time, so they appeared to pulsate. These larger explosions firstly appeared as a dull grey/white light, then rapidly increased to a very bright white light which seemed to be very

slightly tinged with blue or yellow; these lights expanded to a diameter of 80–90 cm. The small explosions lasted for 2–3 seconds, whilst the larger ones lasted 10–12 seconds.

The echo sounder was run, and the Aldis lamp flashed into the sea, both having no visible effect. A water sample was taken, left for half an hour and then checked with a torch, but again there was no effect; it was also peered at through a magnifying glass, still nothing was seen. Course of ship 203°, speed 13.0 knots, 80.9 r.p.m.

Weather conditions at the time were: dry bulb 22.8 °C, sea 23.4, wind NNE'ly force 4 veering NE'E'ly force 4, clear skies.

Position of ship at 0244 GMT: 21° 55'N, 19° 12'W.

Note. Dr P.J. Herring, of the Institute of Oceanographic Sciences, comments:

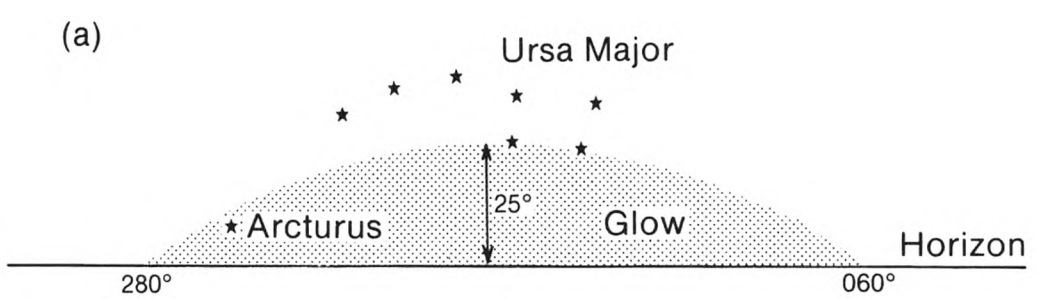
'I believe that the many small 'explosions' of light were the result of the vessel passing through a swarm of luminous jellyfish, either one commonly encountered called *Pelagia noctiluca* (on account of its luminescence), or comb-jellies. The larger, deeper light sources are harder to interpret. They may simply have been larger, deeper specimens whose light was additionally diffused by their depth, but if this was so, the increased duration of the flashes is unexpected'.

AURORA BOREALIS

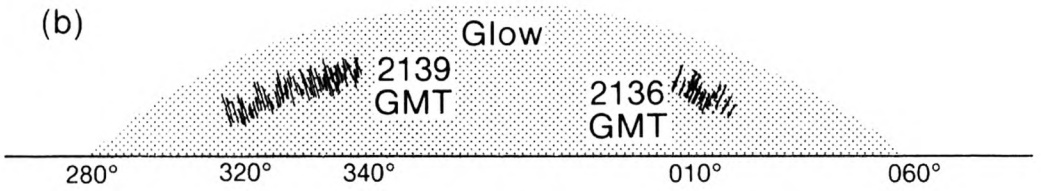
North Sea

m.v. *Texaco Windsor*. Captain R. Arkless. Immingham to Sullom Voe. Observers: the Master, Mr E.C. Neal, 3rd Officer, Mr P. Jones, Lookout and members of ship's company.

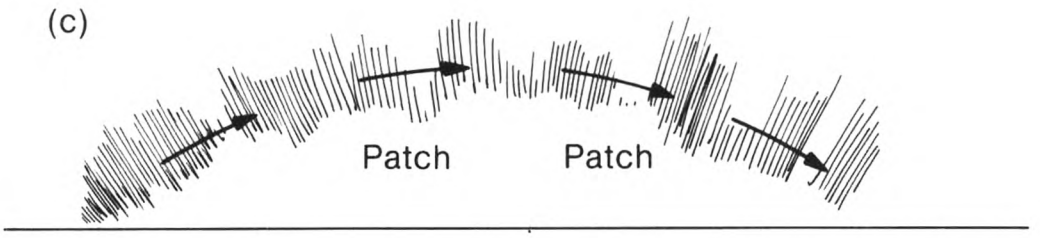
22 September 1987. At 2045 GMT an auroral display started as a glow with a faint arc towards the top of the glow itself. The display was quiet, of moderate brightness and with a maximum altitude of 25°, see sketch (a). By 2119 an arc had formed dividing the glow in half horizontally. The arc was moderate in brightness and the glow was weak to moderate.



At 2136, bearing between 005° and 015°, altitude approximately 12°, a very faint rayed arc was seen. Three minutes later another rayed arc appeared between 320° and 340°, at the same altitude as the previous one, see sketch (b). The

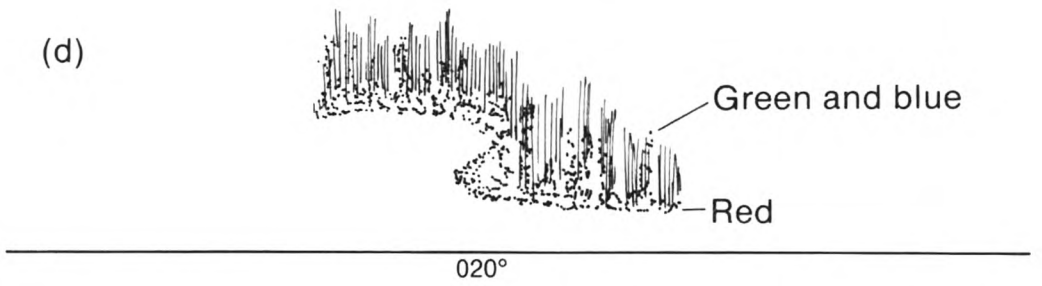


display was still quiet and of moderate brightness. Then at 2141 rays appeared from the glow, and at 2146, the display became active as it transformed into a rayed arc across the horizon, with rays 'flowing' from west to east. Moderate brightness with occasional bright patches, see sketch (c).



At 2155 the activity decreased and an arc/glow appeared with homogeneous bands and a few bright patches. Overall, the display was bright. The activity was regained at 2157 with rayed bands moving from west to east, they were of medium length. This ceased at 2200, the display becoming a rayed arc with a slight glow and a little activity, it was still moderate to bright. Between 2204 and 2217 the aurora consisted mainly of various arcs at differing altitudes ranging from 5° to 20°.

At 2224 the aurora became active again, homogeneous bands with waves 'flaming' upwards reached the observers' zenith. Rays were also present to the west, bearing 300°–320°. The brightness was moderate. Long rays appeared from a glow with a rayed band at 2232; however, at 2239 the sky was becoming obscured from the west, but there were still rays bearing 035°, with 'flashes' overhead and behind. Over half the sky was now covered by the show. The activity of the aurora was at its greatest and most spectacular at 2247. In addition to that described for 2239, a rayed band had appeared (having developed from a bright patch) and began to wave, see sketch (d). As the band got brighter, colours



could be seen, the lower edge was red with blue and green rising up from the lower red band. This part of the display lasted for only 30–40 seconds.

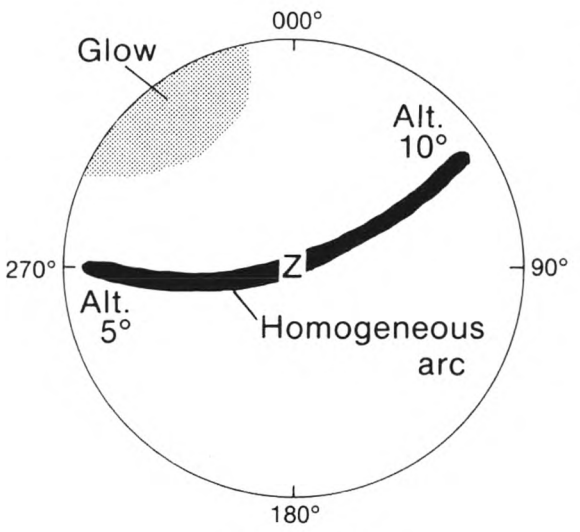
At 2249 the activity stopped although the glow remained, the sky was covered by 5 oktas of cloud and observations of the aurora ceased.

Position of ship: 59° 49′N, 02° 15′W.

Western North Atlantic

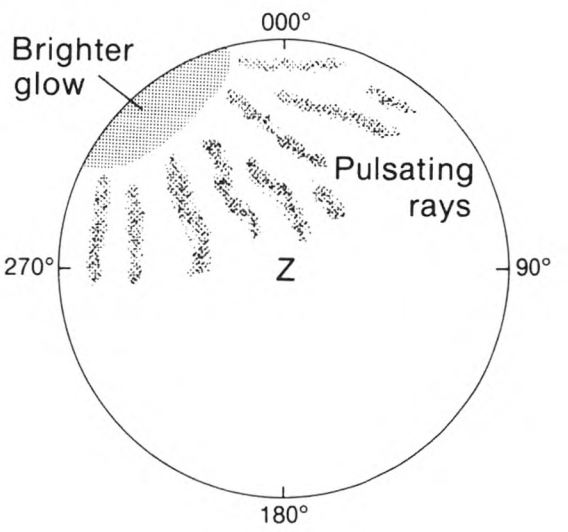
m.v. *Atlantic Amity*. Captain R. Kitchener. Sullom Voe to Quebec. Observers: Mr J.D. Murray, Chief Officer, Mr T.B. Harris, 3rd Officer and members of ship's company.

1 September 1987. At 0120 GMT whilst transitting the Strait of Belle Isle, a homogeneous arc was observed starting 5° above the horizon, bearing 270° and passing through the zenith to finish above the horizon, bearing 060°. It was accompanied by a pale glow showing about 20° above the horizon to the magnetic north. At this time there was nothing between the glow and the arc. The appearance was as shown in sketch (a). The arc started pulsating at 0135, before finally disappearing at 0140, just leaving the glow.



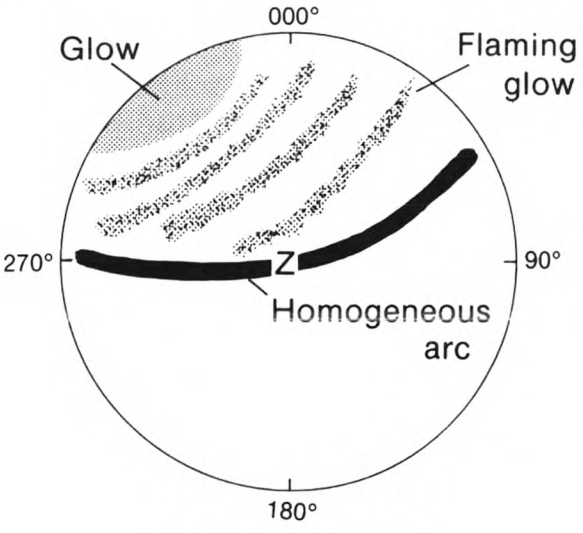
0120 GMT

(a)



0315 GMT

(b)



0350–0410 GMT

(c)

The glow remained low until 0315 when it increased considerably in brightness and extended to the zenith forming a large auroral display which covered half the sky with numerous pulsating vertical rays of varying intensity being visible, as shown in (b). The colour was pale grey. At about 0345 the pulsating stopped, and

it remained quiet for five minutes before the activity changed to 'flaming', accompanied by another homogeneous arc which formed around the flames see sketch (c). The display finished at 0410; cloud cover throughout had been light cirrus.

Position of ship: 51° 40′N, 56° 20′W.

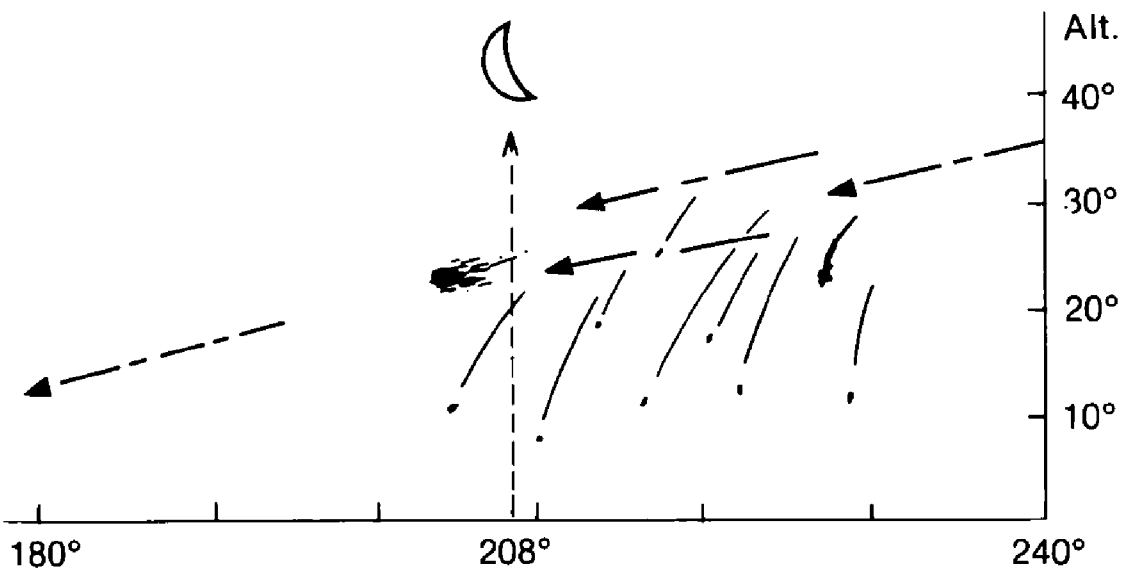
SATELLITE RE-ENTRY

North Atlantic Ocean

m.v. *Abbey*. Captain R.A. Whistler. Norfolk, Va. to Richards Bay. Observers: Mr M.G. Vanstone, 3rd Officer and Mr K.B. O'Neill, A.B.

2 September 1987. At about 0010 GMT a dim glow was observed bearing 300° from the vessel, and lasting for 2–3 seconds; 20 minutes later, a very well-defined satellite re-entry was observed falling slowly across the western sky.

As indicated in the sketch, the display consisted of sections, the leading one of which was particularly large with flames being visible to the naked eye, and



trailing back some distance. This large section was followed by several brightly glowing smaller sections at various distances and elevations.

Large amounts of debris were seen to fall throughout the passage of the satellite which passed through an arc of 60°, from an elevation of 35° at first sighting, to 15° on fading. The duration of the display was approximately 40 seconds, and the light intensity was at least that of the star Sirius throughout.

At the time of observation the wind was ENE'ly, force 3, there was 1 okta of small cumulus and the visibility was excellent.

Position of ship: 27° 24′N, 61° 48′W.

Note. Mr H. Miles, Director of the Artificial Satellite Section, British Astronomical Association, comments:

'This report recorded the decay of a fragment associated with the Soviet satellite Cosmos 1813, launched on 15 January 1987. Soon after launch it disintegrated, and since then many of the fragments have decayed. By the end of 1987, the number of recorded decays had reached 120.'

551.576.2:551.507.25:551.508.761

Evaluating observations of oceanic cloudiness*

By A. Henderson-Sellers and K. McGuffie

(Liverpool University)

Determination of cloud amounts over oceans is a problem which has concerned meteorologists for many decades. Although satellites now offer relatively homogeneous coverage of the oceans, climatologies are likely to continue to include surface observations because multi-layered cloud fields cannot yet be described from satellite data alone.

The use of surface data to validate ship or satellite derived cloud amounts often fails because only island stations offer a long-term platform for a comparison and these stations may not offer a comparable data base. For example, it has been found that the cloudiness over Barbados could be 52% while over the adjacent ocean to the west the cloud cover was only 35%. Although routine meteorological observations from ships is acknowledged to include a fair-weather bias, there is a large volume of data which might be analysed for climatological purposes. In this study the character of the cloud cover over the eastern Atlantic Ocean, the Indian Ocean and the Mediterranean Sea has been examined by utilizing all-sky cameras mounted on board two NERC vessels, R.R.S. *Charles Darwin* and R.R.S. *Discovery*. Although only of short duration, the quality of the returned data was high.

All-sky cameras have already been used rather extensively in cloud studies. Examples include the relationship of radiation to cloud cover over Missouri, cloud-free line of sight probabilities and cloud height and movement over Barbados in 1969. During GATE (the Global Atmospheric Research Programme's Atlantic Tropical Experiment) this type of camera was used to take photographs every 15 seconds so that cloud formation and dissipation could be studied.

Oceanic cloud data retrieval

The data used in this study were gathered using cameras placed on board R.R.S. *Discovery*, during its voyage from Falmouth to the Mid-Atlantic Ridge between the 15th May and 25th June 1986, and on R.R.S. *Charles Darwin* during its Indian Ocean research cruise from June to August 1986 (Figure 1).

The cameras (Canon T-70s with 7.5 mm focal length 'fish-eye' lenses), were programmed to take one photograph every 40 minutes and to record the day and time (GMT) on the negative. They were loaded with normal 36 exposure, 35 mm, 100 ASA, Fuji colour-slide film, each film lasting exactly 24 hours.

The cameras were mounted within protective domes and positioned above the bridge, at a point which gave the clearest possible view of the sky whilst still providing easy access. Radio antennae and the ship's mast were visible in all pictures but did not prove a significant obstruction to the photo analysts.

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* Reproduced from NERC News, October 1987, by kind permission of the Editor.

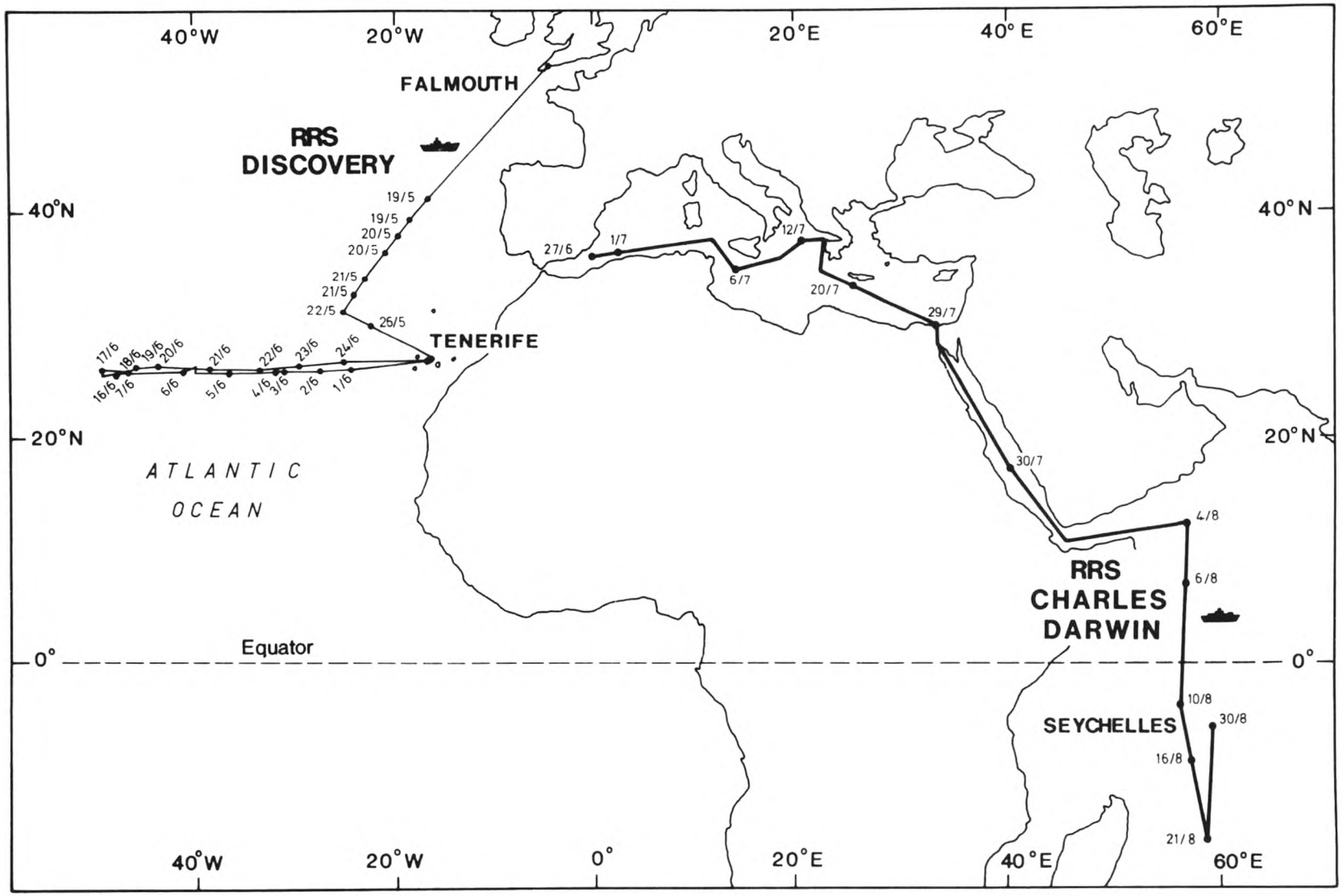


Figure 1. Map of routes and dates of voyages of R.R.S. *Discovery* and R.R.S. *Charles Darwin.*

The camera housings were placed in a gimballed mount so that the camera would remain pointing to the zenith despite any pitching or rolling of the ship. Unfortunately, during transit to Falmouth one of the mounts was damaged, causing it to stick at a slight angle to the horizontal; this camera did not quite view the complete sky dome. The 2.9% reduction in total area seen introduced a possible error of less than a third of an okta (one eighth) of sky cover.

Approximately 1,720 adequately illuminated photographs were obtained. These were analysed by overlaying a 34-element grid designed to provide equal weight to different areas of the sky, and determining cloud cover in each of 34 elements. The intention is to imitate, as much as possible, the technique employed by human observers making real-time surface observations and consequently the method will inherit certain biases. Clouds directly overhead will cover more of the grid than those on the horizon, and areas on the horizon may contain more clouds than one overhead. The method will also suffer from viewing cloud sides and failing to record small breaks in cloud at locations distant from the camera. In some previous work with all-sky cameras, attempts have been made to remove the errors in cloud amount, associated with estimating cloud totals on the horizon, by excluding the area less than 15° above the horizon. However, since part of this study was aimed at comparison between the camera-derived amounts and the standard surface observations the whole sky dome was evaluated.

Total cloud amount retrievals are in good agreement with the traditional observations from the bridge. Figure 2 shows surface observations against camera-derived total cloud amounts. The all-sky camera results have been

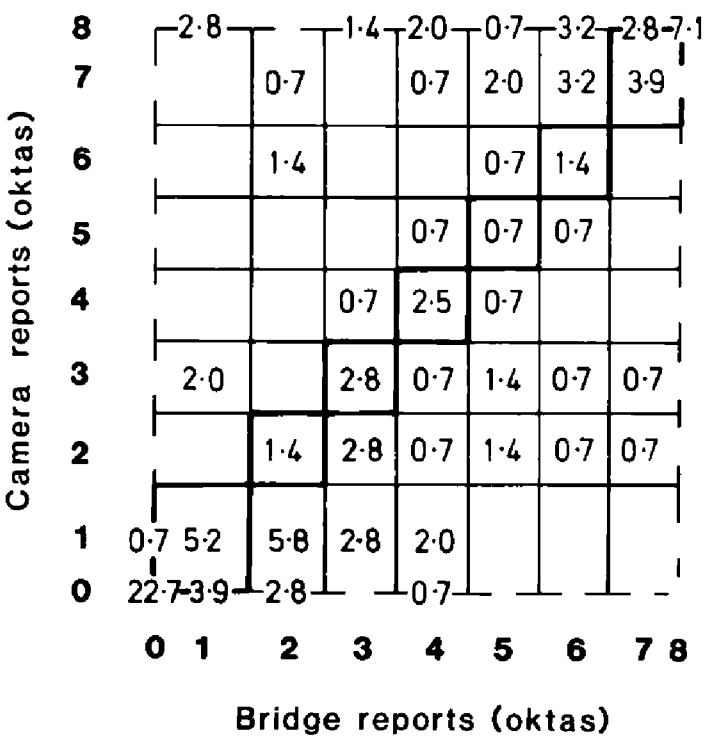


Figure 2. Scatterplot of surface (bridge) observations of total cloud amount against photo-retrieved cloudiness for the voyages of R.R.S. *Discovery* and R.R.S. *Charles Darwin*. The values are shown as percentages of the total number of coincident observations. Zero scores have been omitted from the diagram.

grouped into the okta code to make the data sets more comparable. Values are shown as percentages of the total number of coincidental reports from both voyages. The scatter of values indicates an over-estimate of small amounts of cloud, by the surface observer, and an underestimate of larger cloudiness values. The difference may in part, be accounted for by the greater precision involved in the analysis of all-sky camera photographs, the lack of which induces 'rounding errors' in surface observations, but may also be due to the bias of the surface observer towards certain numbers. Overall, however, there is good agreement between the conventional reports and the all-sky retrievals.

One feature which this study has underlined is the considerable temporal variability in cloud amount. For example Figure 3(a) shows the sky state at 1120 GMT. The part-halo around the sun permits unambiguous identification of cirrus cloud and there is clearly underlying cumulus too. By 1200 (40 minutes later) the sky cover has increased considerably (Figure 3(b)). The 1200 bridge report is 5 oktas cloud amount which is in good agreement with the photograph. At first it might be thought that the centre-sky cloud in Figure 3(b) is low-level cumulus and that the sky state is, perhaps, changing rapidly due to energetic convection. Closer inspection of the original film image reveals a complete, though poorly resolved, halo around the sun on the 1200 photograph. As ship observations are made before the reporting time, the sky cover could have changed considerably in the intervening 10–15 minutes in certain cases. More importantly the usefulness of 3- or 6-hour samples must be re-examined in the context of better time-sampled data.

Generally cirrus cloud was less accurately reported than other cloud types and when cirrus was reported by the surface observer, its type and appearance were often incorrectly recorded. Throughout the voyage the only types of high cloud given were 1, 2 and 8, as described in the WMO code table, with 1 being by far the most common. Although, during analysis of the all-sky camera photographs, cloud types were not recorded, it was soon recognized that more than three types of cirrus cloud occurred. Misidentification in this manner can be misleading in terms of the optical thickness of the cloud and the form its coverage takes. These characteristics might become important if an evaluation of cloud/climate interactions in terms of the ocean surface radiation budget were to be attempted.

Cirrus cloud covering less than 1 okta of the sky was overestimated by the surface observer since cloud cover must be given to the nearest okta, yet the camera often showed high cloud cover amounts smaller than one-eighth. Comparing the values for the surface observation times which coincided with those of the camera frames, the traditional recording method gave an average cover of 1.1 oktas compared with the all-sky camera reports of 2.7 oktas. Thus the overestimate of small amounts of cirrus by the observer does not compensate for the occasions when the presence of high cloud is not noticed by the bridge observer.

It is important to recognize that although in most cases it is fairly easy to identify cloud type from the all-sky camera pictures (e.g. Figure 3) there are some ambiguous images. In particular it is extremely difficult to be certain whether a tenuous sky covering is thin, high cirrus cloud or a low-level haze. Sometimes the history of sky cover is an aid and, of course, the occurrence of a halo permits an unambiguous identification.

The radiation balance at the ocean surface is more closely controlled by cloud amount and cloud character than by any other single factor except top-of-the-

atmosphere variations in insolation. The very short-period fluctuations in cloud amount detected by the 40-minute sampling used in these experiments raises the question of whether 3-hour, or worse still 6-hour, time samples provided by standard synoptic reports capture the oceanic cloud characteristic adequately.

The preliminary results of analysis of over 1,700 photographs show general agreement between traditional surface observations and all-sky camera retrievals for total cloud amount and most cloud types. There is, however, a tendency to underestimate (or miss completely) cirrus cloud cover; a result which is in agreement with an earlier study in the Brazilian Amazon. This study also obtained larger cloud amounts than the climatological values and found cirrus cloud to be present on many occasions.

The results described here show that, in general, the observations of cloud amount and type made by ships' officers are sound and would provide a satisfactory basis for an oceanic cloud climatology. Two difficulties have been identified however. The total cloud amount varies considerably over short time periods, possibly making averages of sampled data, such as those provided by synoptic observations made at 3- or 6-hourly intervals, different from averages constructed from more frequent samples. Secondly the difficulty of detecting and correctly identifying cirrus cloud has been underlined. Occasionally bridge observers failed to report cirrus cloud clearly identifiable on the all-sky photographs. This result underlines the usefulness of obtaining an objective record of cloud character such as that provided by all-sky camera photographs. The IS-CCP regional experiments might benefit considerably from analysis of such a data set, especially when detecting cirrus cloud is an objective. On the other hand it should be noted that differentiation between cirrus cloud and haze is difficult in many circumstances. It is possible that real-time retrievals are better able to distinguish between thin cirrus and haze than later analysis of photographs. Improved training of ships' officers could significantly improve reporting of these 'difficult cases'.

This work was supported by NERC and the US Air Force Office of Scientific Research.

Opposite page 124.

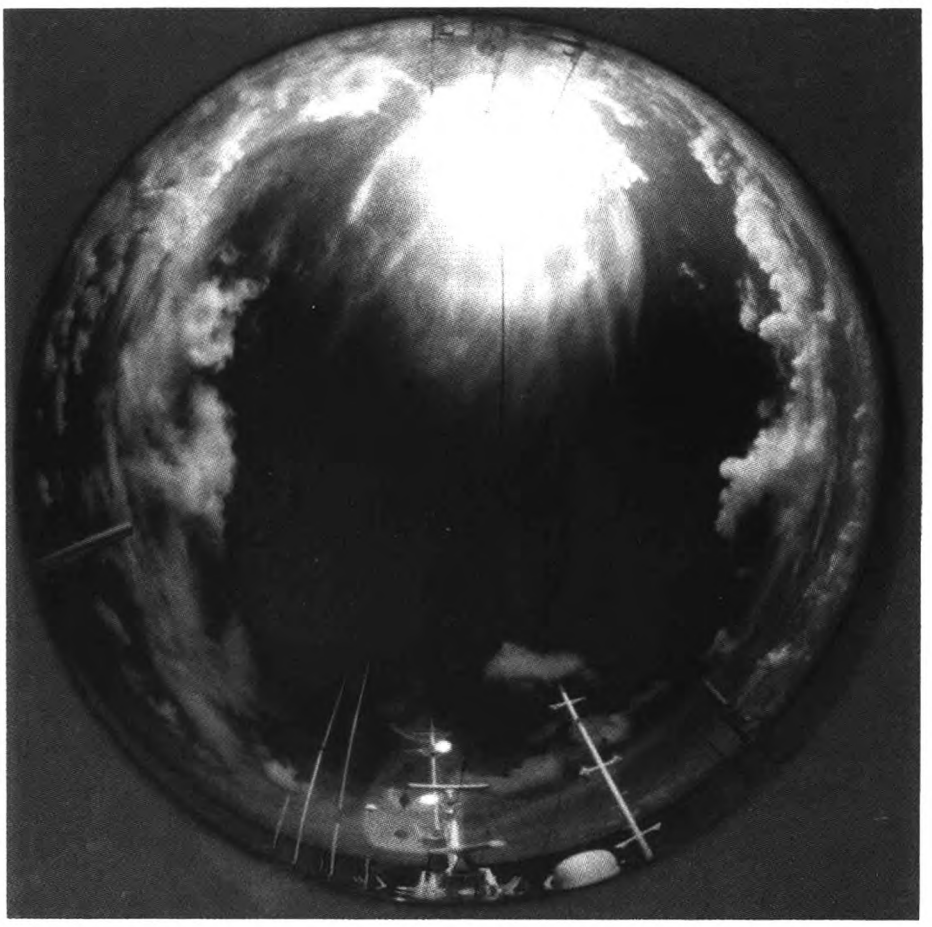


Figure 3(a). All sky image from Discovery for 7 June 1120 GMT.

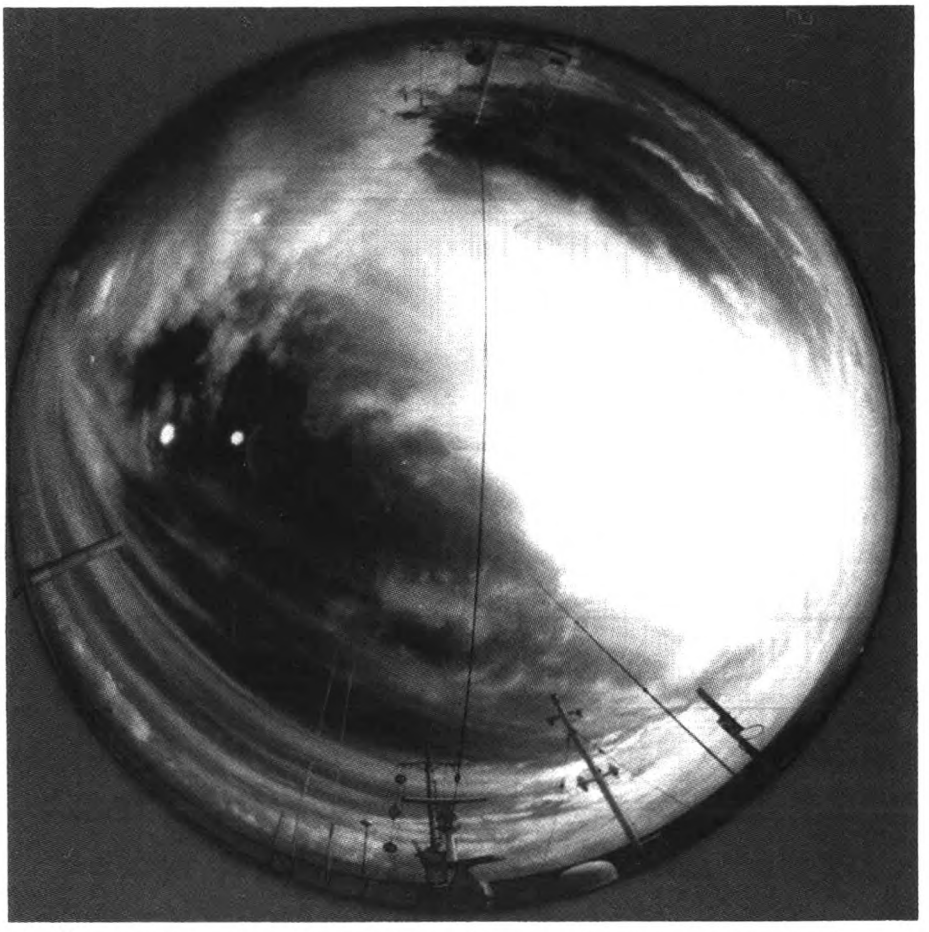
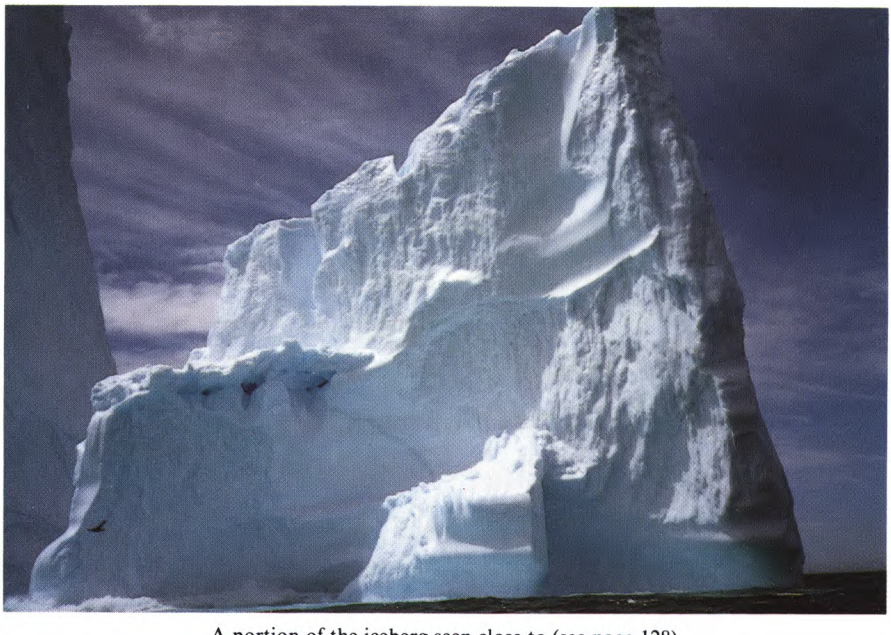


Figure 3(b). All sky image from Discovery for 7 June 1200 GMT.

Opposite page 125.

Iceberg seen from f.p.v. *Falklands Desire* (see page 128).



A portion of the iceberg seen close to (see page 128).

Photos. by R. N. Amery, reproduced courtesy J. Marr (Shipping) Ltd

Radar anomaly in South African waters

In early July 1987, the deck officers on board the South African research ship *Africana* observed a radar anomaly off the west coast of South Africa.

Between 6 July and 8 July, a strange radar echo was observed on both the vessel's Decca 3 cm radar sets; the echo appearing for the first time on the evening of the 6th.

The shape of the echo was observed to change continually. Figures 1 and 2 show its appearance on the 7th at 1500 GMT and 1600 GMT respectively, see also Figure 3 opposite page 108. At 1910 the echo had opened up, and two echoes were then present, one on each side of the heading marker, see Figure 4. The echo eventually faded, only to reappear at 0000 on the 8th. It increased in intensity towards 0600, and remained a strong echo throughout the day. On 8 July at 2200 it finally dissipated.

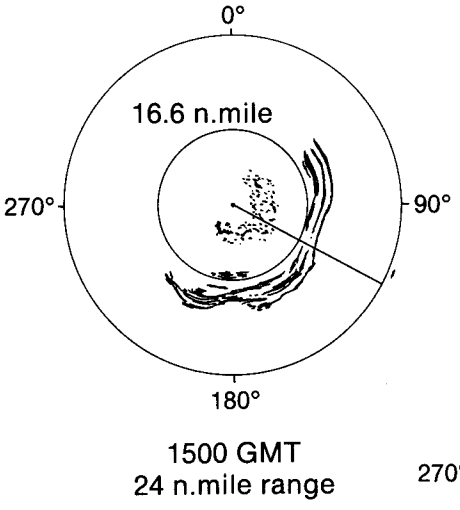


Figure 1.

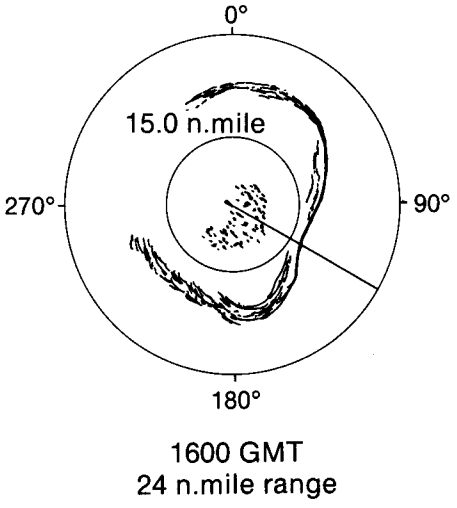


Figure 2.

Contact was made with another vessel in the vicinity, and the same sort of echo for the above period was confirmed. Table 1 gives the meteorological conditions which were experienced on the 7th and 8th.

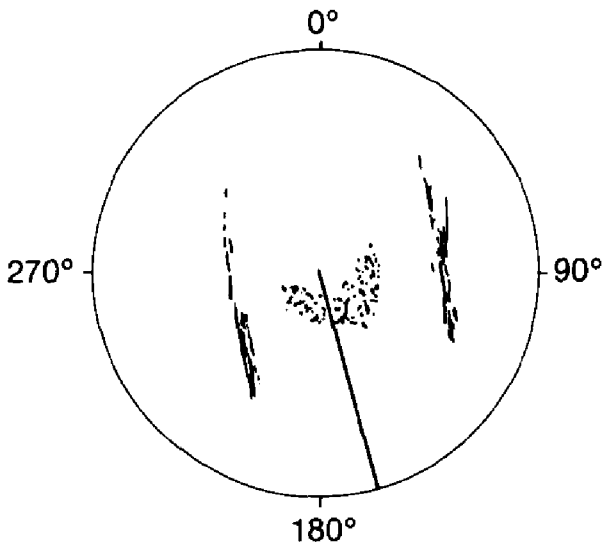


Figure 4.

Table 1 — Meteorological observations recorded on board R.S. *Africana*

Date/Time (GMT)		Ships Position	Pressure (mb)	Wind Dir'n	Force	Temperature (°C) Air	Wet Bulb	Sea	Sea State	Weather
7 Jul.	1500	30°26'S, 15°49'W	1023.0	SE	5	17.5	17.5	16.1	3	Clear
	1910	30°36'S, 15°53'E	1022.1	SE	4	15.5	15.5	16.1	4	Clear
8 Jul.	0000	31°01'S, 16°04'E	1021.0	E	4	16.5	16.5	16.3	3	Clear
	2200	31°36'S, 16°44'E	1018.5	SE	3	16.0	15.0	16.0	3	Clear

During this phenomenon, the radar atmospherics were observed to be remarkably clear. Visibility was also exceptional, with vessels visible at 17–20 n.mile and more.

Comment and Analysis

The phenomenon described above generated much interest and was analysed by both the Met. Office and Liverpool Polytechnic. For the Met. Office, Mr R. Brown, in discussion with Mr J.D. Turton who is currently working on anomalous propagation, agreed that the region off the west coast of South Africa is one in which the meteorological conditions favour the occurrence of above average radar ranges due to anomalous propagation. On examination, the surface charts for 1200 on 7 July and for 0000 on 8 July showed a 'high' centred south or south-west of the southern tip of Africa which produced an offshore flow. Dry (desert ?) air was advected over the sea where rapid moistening of the surface layer would then have occurred by evaporation. Such moistening is indicated by the *Africana*'s observations of virtually 100 per cent relative humidity with a dew point around 16 °C. Over land, dew points were below freezing point, and the Cape Town upper-air ascents showed dew-point minima of −3 and −6.

As is well known, the conditions required for radar ducting (i.e., radar beam bent downwards sufficiently to intercept the surface) are a strong hydrolapse and temperature inversion. The main cause of ducting on this occasion would have been the large lapse in dew point.

It was not clear to the analysts why the anomalous echo did not form a complete circle. It was tempting to suggest that returns were being received from the coast, but the curvature of the echo appeared to be too large for this explanation to be valid. More likely was that farther to the west, the sharpness of the humidity gradient was reduced by continued mixing.

The *Africana*'s account was also studied by Captain A.G. Bole, Extra Master Mariner, FRIN, MNI and Principal Lecturer in Navigation Systems at Liverpool Polytechnic. He suggested that the meteorological conditions (location, wind direction, visibility and high relative humidity) would lead to the suspicion of extra-super refraction; however, he believed that the observed echoes were the returns from the very steep gradient in the refraction index at a slightly higher than normal boundary between the hot dry air coming from the Namib area, and the comparatively cooler 'moist' air over the sea at lower levels, Figure 5.

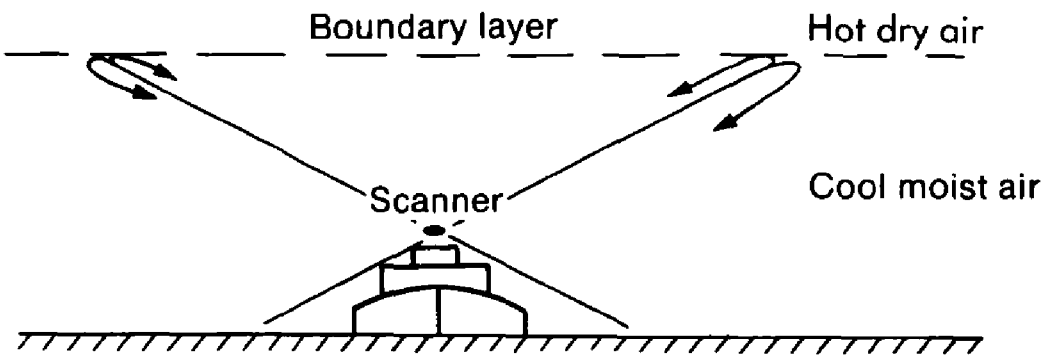


Figure 5.

The 'circular' appearance with intensity variations between day and night, and a dissipation from ahead as the relative humidity falls were all consistent with the explanation, but two interesting points arose. While theoretically possible, refractive-index gradients which are required have not been measured experimentally, but then this is a rather special meteorological area of the world. In the past, false echoes associated with extra-super refraction conditions (see past copies of *The Marine Observer*) have always been 'second' or 'multi-trace' echoes — modern marine radars, and in particular Decca radars, have special circuits which eliminate this form of spurious echo, but not the more nebulous responses from the boundary layer.

Captain Bole thought it quite possible that these echoes have been present at the time of previous reports (for example, a report off Gran Canaria which had suggestions of nebulosity in the drawings) but have been overlooked in the presence of the more 'tangible' second trace echoes.

Icebergs in the South Atlantic

Detailed observations of some very large icebergs have been recorded by several Voluntary Observing Ships north of the Falkland Islands in recent months.

The fishery patrol vessel *Falklands Desire*, currently on charter from Hull-based research and fishing vessel operator J. Marr and Son, made a close inspection of some of several large icebergs observed between 22 and 28 November 1987 within a 20-n.mile radius of position 41°S 56°W. The observers recorded in their meteorological logbook when on passage from Port Stanley to Montevideo, and on the return passage, that the ship stopped three miles off the largest tabular berg and the inflatable boat was sent in for a closer look and the taking of photographs (see front cover and page 125). This huge berg was estimated to be 100 m in width, 200 m long and 100 to 150 m in height. Later it was calculated to be 120 m high by vertical sextant angle. The iceberg was surrounded by large quantities of brash ice up to 1.5 m long and calving was continuously taking place, accompanied by loud noises similar to thunderclaps as pieces fell off the main berg. The iceberg was predominantly white in colour although parts of it appeared to be sky blue and brilliant turquoise. After the second sighting of this group of bergs it appeared that two of them had drifted north-eastwards at between 10 and 15 n.miles per day on the Falkland Current as might be expected, whereas the other two had apparently drifted south-eastwards for about the same distance as though to rejoin the main easterly flow of the Southern Ocean Current. The icebergs had been visible on radar at ranges of between 17 and 53 n.miles, the latter being the range at which the target was lost, possibly an even larger berg than the one closely observed, and estimated to be 1.5 n.mile in length.

Captain J.C. Jones and the staff of the *Falkland Desire* are to be congratulated on producing an excellent report and superb photographs of the event, all of which will be usefully added to historical records of South Atlantic ice movements. We are also grateful for permission to reprint material from press information and from *Notices to Marriners*, the house journal of the J. Marr Limited group of companies, and for the help provided by John Davis and Associates, Public Relations Marketing, Hull, in supplying the material and photographs.

Two other ships of the Voluntary Observing Fleet reported iceberg sightings in the same area in the following months and from the observers' reports and sketches it is possible that some of them may have been the same bergs reported earlier by *Falklands Desire*. On 24 December 1987 *Maersk Gannet* reported sighting two icebergs in approximate position 44° 00'S, 52° 00'W and *Remuera Bay* logged the positions of three bergs on 26 January 1988 between 43° 26'S, 50° 30'W and 42° 25'S, 49° 50'W.

AURORA NOTES JULY TO SEPTEMBER 1987

By R.J. Livesey

(Director of the Aurora Section, British Astronomical Association)

As readers will have come to expect, marine observations of the aurora received for the period are listed in Table 1. The general pattern of auroral activity as determined by land and marine observers is given in Table 2.

Table 1 — Marine Aurora Observations July to September 1987

Date	Ship	Geographic Position	Time (GMT)	Forms in Sequence
1/2 Aug.	*Australian Venture*	50° 35'S, 154° 32'E	0700–0915	qHA
24/25	*ACT 7*	41° 35'S, 126° 38'E	1110–1140	G, RR, RB, aRB, G
30/31	*Drupa*	59° 50'N, 01° 10'E	2230–2300	RA
30/31	*Sulisker*	60° 45'N, 01° 45'W	2330–0300	HA, RA
31 Aug./ 1 Sept.	*Jura*	56° 13'N, 08° 53'W	2230–0340	RA
31/1	*Atlantic Amity*	51° 40'N, 56° 20'W	0120–0410	G+HA, G+pR$_3$R, G+pG+HA (Half sky)
31/1	*Cumulus*	56° 55'N, 20° 36'W	0340–0355	qRR
11/12	*British Steel*	55° 50'N, 43° 50'W	0020–0034	pRA
11/12	*Suilven*	58° 12'N, 06° 23'W	0425–0435	qm$_3$RR
12/13	*British Steel*	53° 01'N, 53° 04'W	2350–0530	G, RB, RA, mR$_2$R, HA, RB, pRR, m$_2$HB, HA+P+RR
21/22	*British Steel*	53° 22'N, 41° 36'W	2335–0530	HA, RA, HA+RR
21/22	*Jura*	56° 26'N, 10° 50'W	0105–0120	G
22/23	*Cumulus*	56° 58'N, 19° 48'W	2240	aR$_2$RB
22/23	*Jura*	56° 42'N, 05° 25'W	0100–0110	pG
25/26	*Cumulus*	56° 48'N, 20° 02'W	2225–0600	am$_2$R$_3$R, RA, qHA, qH+R$_2$RA
26/27	*Australian Venture*	48° 40'S, 112° 10'E	1700–1800	m$_2$HA, mRR, fA, RB, aRB, CmRR, RB, mP
28/29	*Cumulus*	56° 48'N, 20° 08'W	2235–2315	qN

KEY: a = active, f = fragmentary, m = multiple, m$_2$ = 2 forms, m$_3$ = 3 forms, p = pulsating, q = quiet, A = arc, B = band, C = corona, G = glow, H = homogeneous, N = aurora of unspecified form, P = patch, RA = rayed arc, RB = rayed band, RR = rayed structure, R$_2$R = medium rays, R$_3$R = long rays.

Since the sunspot minimum in September 1986, it has not been surprising to observe more sunspots in 1987. These can be seen as black marks on the face of the sun by focusing the rays of the sun, by means of a small telescope or a pair of binoculars, onto a white card. Never look directly at the sun, even with the naked eye, as the sun's rays can cause instant damage to the eye. Navigators do look directly at the sun through the very small telescopes fitted to sextants, but these

Table 2 — Activity reported July to September 1987 (excluding isolated and doubtful observations).

Date (Night)	Location and Number of Observers	Geomagnetic Latitude Lowest	Highest	at Storm Peak	Maximum Storm Activity code*	Time (GMT)
24/25 Jul.	Shetland, New Zealand (3)	50	57	62	5	1000–1200
28/29	Canada, Northern England, New Zealand (6)	47	59	59	6	0123–1030
11/12 Aug.	Alberta (1)	—	—	64	7	0730–0900
12/13	Alberta, New Zealand (2)	51	64	64	3	1700–0900
13/14	Alberta (1)	—	—	64	6	0800
19/20	Alberta, New Zealand (2)	57	64	64	5	0700–1030
20/21	Alberta, New Zealand (2)	57	64	64	3	1500–0600
25/26	Canada, New Zealand (5)	50	64	64	7	0400–1100
30/31	Scotland, New Zealand (6)	50	62	61	5	1500–0230
31 Aug./1 Sept.	Atlantic (3)	60	63	62	6	2230–0410
9/10	Scotland,Alberta (2)	60	64	64	5	0300–0500
10/11	Scotland, Alberta (4)	61	64	61	5	2200–0600
11/12	Atlantic, Alberta (3)	62	65	65	5	0020–0600
12/13	Shetland, Atlantic, Alberta (3)	62	64	62	7	2350–0530
15/16	Scotland, Finland (4)	57	61	61	5	2245–0220
20/21	Alberta, New Zealand (2)	57	64	64	2	1500–0400
21/22	Atlantic, Alberta (4)	61	64	64	5	2335–0530
22/23	Scotland, Atlantic, Alberta (11)	59	59	64	5	2030–0400
24/25	Alberta, New Zealand (4)	50	64	64	6	0730–1055
25/26	Scotland, England, Canada, New Zealand (10)	51	51	64	5	1230–0100
26/27	Scotland, Southern Ocean (3)	57	62	62	6	1700–0450
27/28	Scotland, Alberta (6)	60	61	64	5	2045–0500
28/29	Scotland, Alberta, New Zealand (4)	57	64	57	5	1200–0300
29/30	Scotland, New Zealand (6)	57	60	61	4	1500–0349

*Storm Activity Code: 1 = Glow or unspecified form, 2 = Homogeneous arc, 3 = Rayed arc or band, 4 = Ray bundles, 5 = Active, pulsating or flaming forms, 6 = Coronal or half sky, 7 = All sky storm.

have special filters to screen out the dangerous energy. The mariner is interested only in the shape of the sun and its position, while the astronomer is studying the whole face of the star and hence requires bigger telescopes to obtain the necessary resolution of detail, and has the problem of dealing with more heat in the solar rays. Notwithstanding the existence of special equipment that can be fitted to a

telescope to deal with the problem, projection onto a screen is the only safe way for non-specialists to view the sun's surface.

Increasing solar activity is leading also to more geomagnetic disturbances and consequently to more frequent appearances of the aurora in mid-latitudes equatorwards of the permanent auroral oval in the polar regions. The first half of 1987 saw a lull in activity which generally follows after sunspot minimum. In July, things began to happen again. To illustrate the situation, Figure 1 is a Bartels Diagram which is a series of twenty-seven successive days corresponding to the sun's period of rotation as seen from the Earth. Thus, if there is an active zone on the sun, each time the sun rotates, any activity generated by this zone will appear on successive dates one below the other. If, on the other hand, the active zone is drifting relative to the sun, bearing in mind that the sun does not rotate like a solid, then active dates may well drift sideways in the Bartels Diagram. Three lines and a date line are given per 27-day sequence, representing the presence of significant auroral activity, magnetic disturbances and radio auroral effects, the latter as reported by United Kingdom amateur radio operators. Minor activity and isolated reports have been excluded. It will be seen how the first half of the year was relatively quiet followed by the rise in activity. The whole year is shown for completeness although activity from October onwards will form the subject of the next report.

In recent years, we have been in the habit of referring to the locations of auroral observers in terms of geomagnetic latitude and longitude, which are similar to lines of geographic latitude and longitude except that the central axis to all intents and purposes joins the magnetic poles through the centre of the Earth. Such a set of co-ordinates has a geometric construction but, as mariners well know, the Earth's magnetic field distorts from the theoretical shape. This is due to variations in geology, electrical conductivity and the effects of the sun upon the magnetic field in the high atmosphere. Geophysicists use an alternative co-ordinate system called the 'invariant latitude' that more clearly reflects the actual shape of the field.

Recently we investigated the relative visibility of the aurora in North America, Canada in particular, the North Atlantic Ocean and the United Kingdom. It was found that the aurora penetrated further to the south in Canada than in the United Kingdom relative to the north magnetic pole, more clearly following the invariant latitude distribution than the geomagnetic co-ordinates. A review has now been made of observations received from ships in the Southern Hemisphere, and from the observers of the Royal New Zealand Astronomical Society, Aurora Section, whose director is Bob Evans based in Invercargill. Again, we find that the distribution of auroral sightings in the New Zealand sector more clearly follows the invariant latitude. For example, Campbell Island, south of New Zealand, and Unst in Shetland have approximately the same invariant latitude of 60 degrees, yet the former has a geomagnetic latitude of 57 degrees and the latter a geomagnetic latitude of 63 degrees, and both have similar auroral experiences. So keep observing and sending in your reports for you never know what interesting finds we can make from them.

Finally, readers may wish to see a scoreboard showing the number of reports received over the years, either as entries in the meteorological logbooks sent directly to Bracknell, or as detailed reports made out and posted to the Association. The figures shown in Table 3 may not yet be complete for 1987 and should be taken as provisional. The annual totals should not be assumed to bear

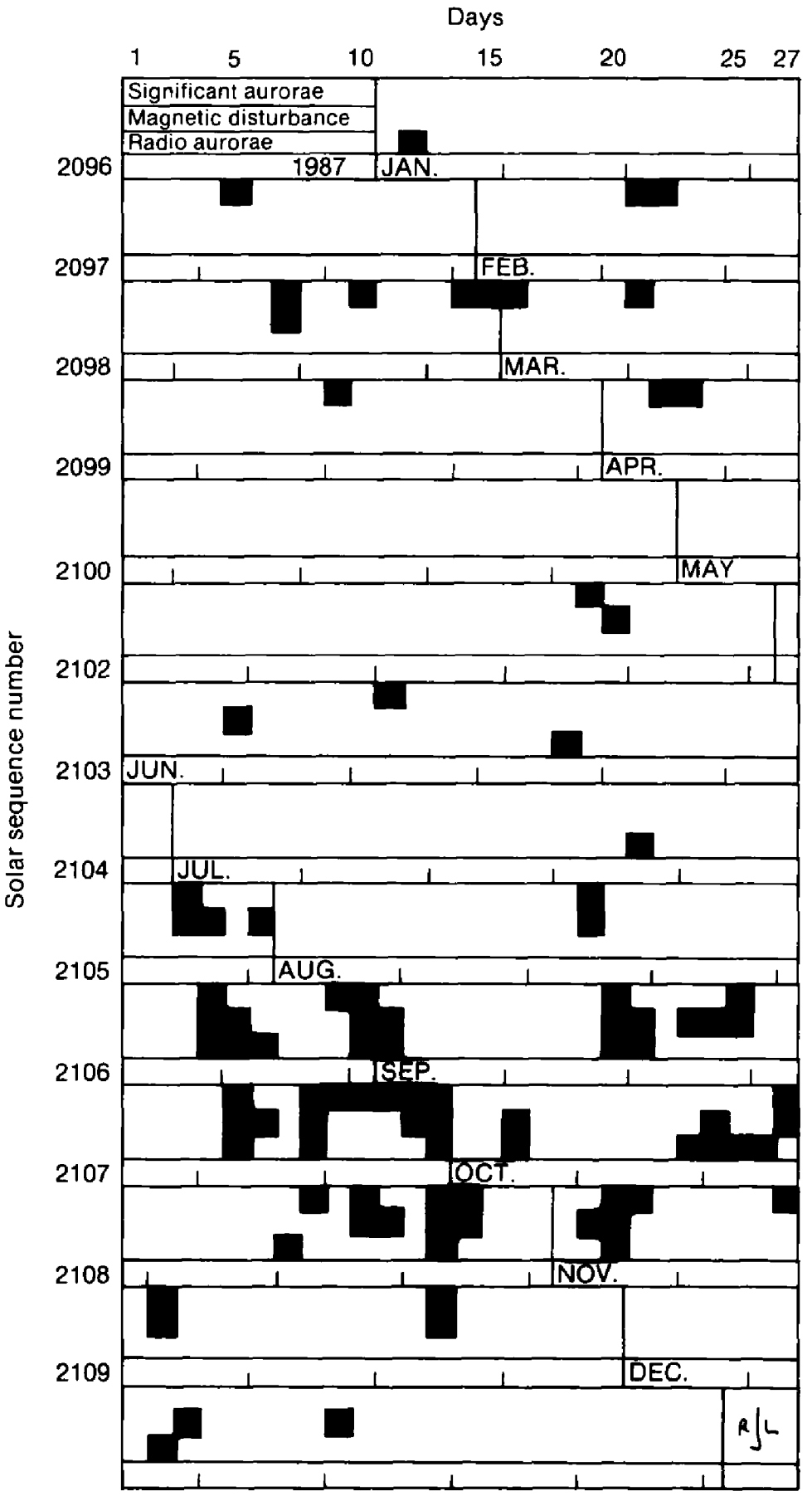


Figure 1. Bartels Diagram.

a relationship to the activity of the aurora, for much depends upon where the individual ships were when they made their observations. Many thanks for your support over the years and for all the data that you have sent to us.

Table 3 — Marine Auroral Reports received per quarter, 1976–87.

Year	January-March	April-June	July-September	October-December	Total
1976	34	10	10	17	71
77	15	1	6	8	30
78	9	12	10	8	39
79	24	2	7	8	41
80	9	19	14	17	59
81	13	13	17	30	73
82	16	6	19	11	52
83	8	2	11	17	38
84	16	8	31	16	71
85	12	14	17	11	54
86	18	15	14	10	57
87	12	3	17	2	Provisional

From *The Marine Observer* 40 Years Ago

In considering the activities of the British Selected Ships, it is instructive to recall that, on the outbreak of war in 1939, the average daily number of observations received at the Central Forecasting Office was 33.5, whereas this average reached a maximum of 92.1 in February 1948. This is a truly remarkable achievement, and it is true to say that the resultant improvement in the network of observations in the North Atlantic Ocean is such that considerably greater accuracy in weather forecasting has been made possible. Who knows — if we continue at this rate, the music hall and newspaper cartoonists may have to find another character to supersede the forecaster for their meteorological humour.

In this modern age, accurate weather information plays an important part in all our lives — industry, transport (by sea, air and land), town planning, sport and social activities, all depend, in one way or another, for efficient operation upon meteorological information. One might reasonably reply: 'Still, we got on all right in the past'; but we are now living in a very competitive age in which the country which applies its scientific knowledge to the best advantage is the most efficient and perhaps the most successful. And we in Britain, faced as we are with a financial crisis of unparalleled gravity, cannot afford to be inefficient. It is not beyond the realms of possibility that an accurate weather message from a ship in the Atlantic might be the means of enabling fruit farmers in Kent to take precautions to safeguard their strawberries from frost damage. It is a small world. I read of one farmer who does not trust the meteorologists, but has a cunningly arranged alarm clock which 'goes off' if the air temperature becomes as low as 32 °F.

LETTERS TO THE EDITOR

From Captain H.C. Hynard, on the occasion of his retirement from P. & O. General Cargo Division in 1987.

'I served my apprenticeship in six coal burning tramps carrying coal and iron ore, amongst other cargoes. It was therefore nothing new to me, after many years in refrigerated vessels, to join m.v. *Ormond* and again carry similar cargoes of coal and iron ore. However, in 38 years the quantity per load was some 35 times more in weight and the ship's service speed about 3.5 knots more. I never completed the full circle as *Ormond* was fuelled by oil and not coal.

'One of my more interesting voyages concerning people was in R.M.S. *Rangitoto* when serving as Second Mate in 1958, when Sir Vivian Fuchs and his wonderful Antarctic party travelled with us from New Zealand for home. There were some marvellous stories told of their successful expedition, which never appeared in his book, which was mostly compiled during his five-week voyage.

'When standing by new tonnage as Chief Officer I experienced the stranding of m.v. *Westmorland* on a sandbank in the River Clyde in the winter of 1965/66. This happened during a storm which reached hurricane force on a wet winter late afternoon just before dark. The forward mooring bollard pulled out of the wharf due to the force of wind on the ship's side, thus causing all the other forward moorings to carry away, ripping out some of the fairleads and lifting bitts from the decks. The ship was in the fitting-out basin at Greenock and at that stage of building had no anchors or engines in commission. *Westmorland* swung right round and the high stern came over the quay, striking the leg of a large crane and causing it to fall right along the wharf, crushing a lorry whose driver had just alighted in order to have a better view of the excitment and thus avoiding injury. The crane driver who came down with his crane was not so lucky, suffering severe injuries but later recovering. At that time Lithgow's employed a number of horse-drawn carts to take furniture etc. down to the ship, and one of these dray horses was standing with its cart when the crane fell, missing it by only a few feet. It was said that it never moved and stayed there quietly until led away. A few electric winches on the wharf were smashed to pieces and finished up looking like alarm clocks that had been struck by a heavy hammer. Finally all remaining moorings were carried away and the ship sailed off the quay trailing ropes, wires, electric cables and compressor units behind her. The stern narrowly missed hitting the Firth of Forth Graving Dock gates, which were closed with an empty dock behind them. Once clear of the basin the ship sailed across the river to land on a sandbank on a falling tide, where all attempts by several tugs to refloat her failed, all lines attached breaking. She was evenutally lifted off on the next high water during the night when the storm had abated somewhat.

'There were 400 workmen on board at this time as well as the Naval Architect, the Chief Engineer and myself from the Company. The Marine Superintendent had gone ashore only minutes before the accident and therefore missed all the action. Most of the personnel were taken off by launch during the evening, wet, cold and fairly miserable. Subsequent dry docking revealed no damage to the hull as a result of the stranding but several bottom plates had to be renewed having been set up a few inches by the keel blocks, which had failed to resettle to the required level after the previous ship had undocked. The rudder was undamaged but the spare propellor had to be fitted.'

Personalities

(Readers are invited to notify the Editor of observing officers retiring from the Navigating and Radio Departments.)

RETIREMENT—CAPTAIN B.O.H. BROWN has retired from Canadian Pacific Steamships Ltd after a varied seagoing career, during the last few years of which he made every effort to co-operate in special Met. Office observing projects carried out on board his ship *CanMar Ambassador*.

Bryan Oag Hunter Brown was born on 12 February 1930 and educated at Alan Glen's School in Glasgow from 1942 to 1947. On leaving school he joined the m.v. *Cromarty* of B.J. Sutherland and Company as a Cadet, serving for six years on the same ship and leaving her as a Second Mate in 1953, when Sutherlands was sold. After two years with Turnbull Scott and Company he obtained his Master' Certificate (June 1956) and joined CP Ships. The first recorded meteorological logbook to be received from Captain Brown reached the Office from the liner *Empress of France* in January 1957, although he says he started weather observing on the *Beaverlake* during the previous year. However, his name unfortunately was not recorded in the logbook received from the latter ship in October 1956, and therefore does not appear in his records.

Captain Brown was promoted to Master of the *Beaverash* in August 1966, continuing his interest in weather observing and up to the time of his retirement, contributing a total of 27 logbooks, of which three were assessed as 'Excellent'. Whilst in the Bermudian registered ships of CP he managed to have several of them recruited into the Canadian Voluntary Observing Fleet. There are now six CP Selected Ships observing on behalf of the Atmospheric Enviroment Service of Canada, which has a total of 129 Selected and 255 ocean-going Auxiliary Ships, and 114 Auxiliary Ships operating on the Great Lakes and Inland Waters. Nineteen CP ships observe for the United Kingdom in the Selected category.

When in command of *W. C. Van Horne*, a CP bulk carrier, Captain Brown had his first experience of an early type of Automated Shipboard Aerological Programme (ASAP) installation. All upper air data were transmitted by the ship's Radio Officer via W/T at that time, whereas the latest equipment used aboard the *CanMar Ambassador* and two other North Atlantic ships employs instantaneous transmission via the ASAP equipment and satellite. Captain Brown relates that on one day of very bad weather on the earlier occasion, he nearly lost the diminutive Meteorological Officer who would not let go of the radio-sonde balloon, for fear of the instrument package suspended below it becoming entangled in the radio aerials. Since 1984 Captain Brown has overseen the navigation arrangements necessary to ensure efficient ASAP launches twice per day from the deck of the *CanMar Ambassador* when on trans-Atlantic passage, first with a trial unit and presently with an installation provided by the Finnish Meteorological Institute. He also liaised with the Met. Office in arrangements to launch drifting data buoys in the North Atlantic.

Captain Brown was granted early retirement on 1 March 1988 and hopes to be able to reduce his golf handicap and to be present to see a vegetable planted, nurtured and harvested without being called away in the interim. Our thanks are due for his unstinting co-operation in the past and our good wishes are offered for a happy retirement in the future.

RETIREMENT — CAPTAIN H.C. HYNARD retired on 3 July 1987 after 38 years of life at sea.

Harry Charles Hynard was born in February 1932, educated at Colchester Royal Grammar School and trained at *T.S. Warfleet*. He joined his first ship, *Baron Dunmore*, of H. Hogarth and Sons, Glasgow, in March 1949. After obtaining his Second Mate's Certificate he transferred to the New Zealand Shipping Company in January 1954, remaining with that company until it was taken over by P. & O. in 1971. He remained with P. & O. Group companies until his retirement.

Captain Hynard obtained his Master's Certificate in May 1959 and was promoted to Master of m.v. *Turakina* in July 1973, later serving in the Wild Reefer ships and finally the bulk carrier *Ormond*. His record of voluntary marine weather observing is an outstanding one; his first meteorological logbook was received in April 1953 from the *Baron Fairlie* and 34 years later his 61st log was received from the *Ormond*. Thirty of these logs, almost 50 per cent of them, were assessed as 'Excellent' and he received Excellent Awards in 1956 and 1957. His observing career reached its peak, so to speak, when he was presented with an inscribed barograph by the Director-General of the Meteorological Office in 1983, for long and excellent service in that field.

We are indebted to Captain Hynard for sending us his reminiscences, published under the heading Letters to the Editor in this edition, and send thanks for his unstinting co-operation in the past and good wishes for success in retirement.

RETIREMENT — CAPTAIN E.R. JENKINS retired last December after serving most of his 42 years at sea with the Port Line Ltd.

Ernest Raymond Jenkins was born in Wells, Somerset on 7 June 1929 and received his education at the Wells Blue School. In February 1946 he was apprenticed to the Graig Shipping Company of Cardiff and joined their ship *Graigddy*.

On obtaining his Second Mate's Certificate in June 1950, Captain Jenkins joined the Port Line and in October of the following year he sent in his first meteorological logbook from the *Port Chalmers*, this being one of 17 logs marked 'Excellent' out of a total of 39 submitted during his observing years.

He obtained his Master's Certificate in February 1956 and was promoted to Master in August 1965, taking command of *Port Wyndham*. For his first class observing efforts he received Excellent Awards in 1967, 1968, 1970, 1971 and 1972.

Captain Jenkins' last ship was m.v. *ACT6* and he retired on 1 December 1987; one of his three offspring is now serving with Shell Tankers and we therefore hope the family aptitude for observing the weather has been passed on from father, to whom we wish a happy retirement, to son who we hope to hear from in the future.

RETIREMENT — CAPTAIN T.D. SCOTT retired on 31 August 1987, having gone away to sea at the age of 18 and spent 41 years in the service of the Bank Line Ltd.

Thomas Desmond Scott was born on 22 August 1927 in Bangor, Co. Down, grew up in Holywood and was educated at Sullivan Upper School and the Belfast Nautical School. He started his apprenticeship with Bank Line by joining the m.v. *Irisbank* in February 1946 and making a voyage which lasted 27½ months which he says was not unusual in those days. He obtained his Master's Certificate in October 1955.

Other aspects of his career can best be described in Captain Scott's own words: 'After serving as Chief Officer I was promoted to Master of m.v. *Crestbank* on 1 April 1962 and this voyage was 26½ months in duration; I completed my last voyage on 4 April 1987 thus completing 25 years in command without mishap, and so I consider myself very fortunate. On 9 January 1980 I was honoured by the Company by being promoted to Fleet Commodore, a rank I was very proud to hold until my retirement, especially as it covered the period when the Company celebrated its hundred years in business as a shipping concern.

'Although I was not at sea during the war I was honoured by being selected to lay the wreath commemorating those of the Merchant Service who gave their lives in two World Wars, at the Remembrance Sunday ceremony at Westminster Abbey in November 1985, forty years after the end of the Second World War.

'Following my retirement in August last I would like to say cheers to any old shipmates through the medium of your wonderful publication, and to say "thank you" to Andrew Weir and Company, managers of the Bank Line Ltd, for giving me employment throughout my sea career when I was privileged to serve three generations of the Weir family including the founder, the 1st Lord Inverforth.'

The Met. Office also had the privilege of receiving 26 meteorological logbooks from Captain Scott, 10 of these being marked 'Excellent', and Excellent Awards were earned in 1975, 1981, 1982 and 1983. We wish him well in retirement and good fortune in his aim to dedicate the remaining portion of his life to his wife, daughter and garden, in that order.

RETIREMENT — CAPTAIN C.B. TINGLE retired from the sea with the intention of breeding canaries, on 27 July 1987, after serving almost 44 years at sea in several shipping concerns.

Colin B. Tingle was born in July 1926 and educated at Holy Trinity and Stockton Secondary Grammar Schools. His first deep sea appointment was on the *Empire Noble* in January 1944 and after being apprenticed to the Langdon Rees Company he transferred to Seagers of Cardiff in 1945. During that period he took part in the invasion of France towards the end of World War II, in 1944. He then served with MacAndrews, Court Line and Sugar Line and it was from the ship *Sugar Producer* of the latter company that the Met. Office received the first meteorological logbook which he helped to compile, in October 1952.

Captain Tingle's career led him to join Ropner Management Ltd in 1957, gaining his Master's Certificate in the same year, and he remained with that company up to the time of his retirement. His first command was the *Silver Comet* in November of 1965 and he was Master of many of Ropner's bulk

carriers such as *Appleby* and *Stonepool* in the following years. For light relief, Captain Tingle had as his command the *Thirlby*, a 20,000 dwt tanker, on and off for eleven years.

During his long career, the Met. Office received the benefit of 35 meteorological logs in all, 13 of these being assessed as 'Excellent', from Captain Tingle. Our good wishes for an interesting and successful retirement are offered, amid hopes that all goes well with the bird breeding, and with the care of the son's cockateel, placed in the father's care temporarily to prevent it disturbing the grandchild's slumbers.

J.F.T.H.

Book Reviews

Seabirds of the World – A Photographic Guide, by Peter Harrison. 135 mm × 215 mm, 347 pp., *illus.*, parchment bound. Christopher Helm (Publishers) Ltd, 21–25 North Street, Bromley, Kent BR1 1SD. Price: £15.95.

This work has been designed as a pocket-sized companion to Peter Harrison's standard reference book *Seabirds: An Identification Guide*, which has a large following and contains a wealth of detailed information. The new volume has a text reduced from 220,000 words to about 60,000 but it has the unprecedented number of 741 coloured photographs illustrating the world's 320 seabird species. These photographs were selected from over 60,000 colour slides contributed by more than 300 of the world's leading seabird photographers and researchers. The majority of these photographs have never been published and include pictures of some of the rarest and least well-known seabirds in the world, such as the Fiji Petrel, the Relict Gull and the near-extinct Short-tailed Albatross.

This book is intended mainly for the practical bird-watcher and for this purpose the majority of the fine photographs show birds in flight; at least two photographs are shown of each bird, often at different stages of development or during alternate seasons, and gives an unparalleled selection of references for identification. Only on 23 occasions has it been necessary to resort to paintings in cases where few or no photographs are available, but the paintings also are of high quality. In the interests of including photographs of all possible species, it is good to note that some slightly blurred prints have been included when none better had been forthcoming; but most of them are clear and unambiguous, and it is a truly stunning collection, carefully laid out to aid identification. It will often remain frustratingly difficult to be certain of the exact species of a gliding shearwater as it disappears below a wave crest for the fifth time, and the keen amateur bird-watcher with binoculars may still not be sure of its identity, but armed with this book he would probably have a better chance of identification in the field than with most others. The photograph captions are kept to a simple minimum: number in sequence, Engish name, scientific name, state of growth, month when taken if known and text page reference.

In addition to a comprehensive introduction, there are 108 pages of invaluable descriptive texts accompanied by distribution maps for every species described.

As has been said, the text is abridged to keep the book to an acceptable size for the pocket (a fairly large pocket, such as can be found in a duffel coat, is needed) and the necessarily abbreviated descriptions may detract from the overall excellence of other aspects of this book at times. But the keenest researchers and amateurs will have *Seabirds: An Identification Guide* near at hand to add detail when this is really vital. There is also a unique identification section for distinguishing look-alike species, highlighting diagnostic points to look out for when bird spotting at sea. Separate indexes of English and scientific names aid quick reference, and the whole book is extremely well bound, allowing it to be opened out flat without the pages parting company from the spine, a common fault with many paperback reference works subjected to frequent and rough usage in the field; such sturdiness in a book is a particularly useful attribute in the marine environment.

For the magnificent collection of seabirds in flight alone this superb work is worth owning, and is highly recommended as an addition to any confirmed bird-watchers library, as well as a suitable book with which to start building a collection of seabird identification books.

J.F.T.H.

The Eight Sailing/Mountain-Exploration Books by H.W. Tilman. 235 mm × 155 mm, 956 pp., *illus.* Published by Diadem Books Ltd, London and distributed by Cordee, 3a De Montfort Street, Leicester LE1 7HD. Price: £16.95.

In July 1960 Harold 'Bill' Tilman sent to the Marine Division of the Meteorological Office the first of countless weather logs which he kept on his spectacular expeditions, using the sea for access to remote mountains in high latitudes. Thus started an association of 17 years during which Tilman regularly corresponded with Lieutenant Commander L.R. Philpott of the Marine Division, and resulted in at least six of his books being reviewed in *The Marine Observer* between 1962 and 1977. This sturdy volume contains his five *Mischief* books and the final three covering his voyages in *Sea Breeze* and *Baroque*, before he vanished at sea between Rio and Port Stanley in November 1977, together with six other men aboard the boat *En Avant*.

Tilman's books need little introduction to his many dedicated readers, and this remarkable catalogue of activity described in the eight highly readable books comprises a saga of adventure and endeavour of absorbing interest; the man was after all in the latter half of his life, being almost eighty years old when he perished, though perhaps it was a curiously fitting end, a last voyage in good company. When he bought the Bristol Channel Pilot Cutter *Mischief* in 1954, it was not with the intention of retiring from mountaineering, but he little guessed that he would sail her over 110,000 miles exploring the desolate ice-strewn coasts of the polar regions, from Greenland to Baffin Island in the north, to South Georgia and Kerguelen in the south. *Mischief* met her end in July 1968 after hitting a rock off Jan Mayen, but there was no loss of life on that occasion.

In humorous, learned and informative style, Tilman is frank about his failures as well as his successes in sailing the 45 feet long cutter, built at Cardiff in 1906, on voyages north of the Arctic Circle and south to Patagonia. He felt that there was something intimately linking the arts of sailing and of climbing, each being

concerned with elemental things, and his mastery of English prose makes his accounts of such feelings most readable, as does his salty wit and original way of looking at everything. He is fascinated as much by the mountains as by the sea, and to all those who enjoy the notion of isolation and loneliness, this series of books should prove irresistible. They are also full of maps and photographs, in black-and-white and colour, providing evocative support to each telling word and sentence. He mastered the principles of navigation with speed and accuracy and with remarkable understanding of what he was doing, showing his high level of intelligence. He overcame the difficulties of navigating in high latitudes using only the most basic and old-fashioned equipment and his unique brand of clear logic without emotion. It might be easy to build up a picture of Tilman as a martinet and a misogynist from his writings, but this impression comes from his desire to train and discipline his at-first unseamanlike crew members, and from his few disappointing contacts with inexperienced women sailors. It is probable that he was also shy and taciturn with strangers but he lacked nothing of frankness in his writings.

There can be few better volumes of travel and adventure to have near for dipping into, when one is in the mood, than this compendium of H.W. Tilman's sailing/mountaineering books.

J.F.T.H.

World Shipping Statistics 1988: a graphical analysis of the marine industry, published by Fairplay Information Systems Limited. 210 mm × 297 mm, 150 pp. FISYS, Fairplay Information Systems Limited, 52–54 Southwark Street, London SE1 1UJ. Price: £18.00.

This is the second year of publication of this graphical analysis of the marine industry by the publishers of the well-known weekly shipping journal and other reference works concerning shipping matters. The figures are updated and there is an increase in the number of graphs as well as additional sub-division of the vessel types incorporated in the book.

The FISYS database had its inception in 1967 and it is from that year onwards that the figures have been taken, covering vessels of over 1,000 deadweight tonnes (dwt). The main headings for the graphs are world merchant fleet, new buildings, market prices, ship management costs, freight rates and ports, trade and industry. Fleets are subdivided by flag, owner's country of domicile, country of build and Classification Society.

This is a thoroughly comprehensive display of world shipping information which shows at a glance what many rows of figures cannot achieve without lengthy analysis. If one had forgotten how the peaks and troughs of commerce and fortune had changed in recent years one can be made instantly aware of, for instance, the raw truth of how shipbuilding orders for the British flag have declined since the peak in 1984 and yet the way in which the total shipping laid-up has progressively reduced since the same year. The bar charts, histograms and pie charts are well balanced and uncluttered, although adjusting the eye to big jumps in scale is sometimes confusing and makes interpretation more difficult. This

style is, however, unavoidable when comparing the fleet of, say, Hong Kong-based owners with 20 million dwt of bulkers with the less than 250,000 of Indonesian-based owners, side by side.

Different symbols are used in the graphs for dwt and number of ships, but unfortunately these are not entirely consistent, the symbols being reversed from the norm in one case. In general the graphs are clear and easily understood, and large enough for simple interpolation and comparison when required by the researcher. Editing of the whole publication could perhaps have been improved by ensuring a uniformity of caption style, e.g. whether to use all capital letters or capitals and lower case. There is also an unfortunate lapse of spelling of ports in some cases, but the small errors mentioned here do not detract from the overall appeal of this well organized set of statistics.

J.F.T.H.

Notices to Marine Observers

NEW EDITION OF THE *MARINE OBSERVER'S GUIDE* PUBLISHED

The seventh edition of the *Marine Observer's Guide*, Met.O.477A, has been published. Copies have been mailed to those ships on the January 'Muster List', i.e. those ships not visited by a U.K. Port Meteorological Officer during 1987 and therefore asked to return an inventory sent from Bracknell.

Port Meteorological Officers in the United Kingdom will distribute copies of the new edition to ships when they call at their ports.

SPANISH ARMADA EXHIBITION AT THE NATIONAL MARITIME MUSEUM

From 20 April to 4 September 1988 the National Maritime Museum at Greenwich is celebrating the 400th anniversary of the defeat of the Spanish Armada with a spectacular international exhibition. The fascinating story of how the might of the Spanish Armada, sent by Philip II to invade the kingdom of Elizabeth I, was defeated by a small English fleet, is told with the aid of a fine array of contemporary artifacts gathered from museums and private collections from all over the world. The lavish Royal Courts of England and Spain are brought vividly to life in a series of specially-created tableaux.

Further details of this and other exhibitions can be obtained from the National Maritime Museum, Greenwich, London SE10 9NF, telephone 01-858 4422.

APPOINTMENTS TO THE NAUTICAL STAFF OF THE MARINE DIVISION AT BRACKNELL

Captain A.P. Maytham has been appointed to the Marine Division of the Met. Office and posted to METROUTE, the Ship Routeing Service based at Bracknell Headquarters.

Austin Maytham joined the Thames Training Ship H.M.S. *Worcester* in 1961 and Alfred Holt and Company in 1965 as Apprentice; on gaining his Second Mate's Certificate in 1968 he set out to gain a varied experience in all fields of marine services. He worked in tankers, bulk carriers and ro-ro vessels of several companies before joining Bank Line; he later sailed as Master with Ship Link, Gardline and Knud I. Larsen before coming ashore in 1987. Captain Maytham worked with many companies ashore before taking up his appointment as Nautical Officer. He provided 17 meteorological logbooks during his career at sea, the first of which came from *Astyanax* in August 1967.

Captain E.J. O'Sullivan has also been appointed to METROUTE. He received his early training at the National Sea Training School, Sharpness and King Edward VII Nautical College, London in the 1960s. His sea service included time with Elders and Fyffes, some of his ships being involved with voluntary observing. Captain O'Sullivan's first meteorological logbook was received from Fyffe's *Golfito* in July 1970.

Fleet Lists

Fleet Lists

GREAT BRITAIN (Information dated 21.3.88)

The following is a list of British ships which have been equipped with instruments and which voluntarily co-operate with the Marine Division of the Meteorological Office.

The names of the Masters, Observing Officers and Senior Radio Officers are given as ascertained from the last written returns received. The date of receipt of the last return is given in the second column. An asterisk indicates a new recruitment who has not yet sent in a logbook. Ships which have been fitted with MOSS equipment are indicated in bold type.

All returns received from observing ships will be acknowledged, direct to the ship, by the Marine Superintendent of the Meteorological Office.

The Port Meteorological Officers will make personal calls on the Masters and Observing Officers as opportunity offers, or on notification from the ship at any time when their services are desired.

Excellent Awards are made at the end of each calendar year. The names of the Masters, Principal Observing Officers and Radio Officers gaining these awards are published each July in *The Marine Observer*.

It is requested that prior notification of changes of service, probable periods of lay-up, transfer of Master or other circumstances which may prevent the continuance of voluntary meteorological service at sea, may be made to a Port Meteorological Officer or to the Marine Superintendent of the Meteorological Office at Bracknell.

Masters and Officers are invited to point out any errors or omissions which may occur in the list.

Selected and Supplementary Ships

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Abbey	11.1.88	B. Walmsley	D.G. Lyons, P.M. Newman, M.G. Vanstone	P.G. Corkin	Furness Withy (Shipping) Ltd
ACT 1	9.2.88	R. Brownbill	K. Lumby, A. Hillier, N. Butler	A. Pampling	Blue Star Ship Management Ltd
ACT 2	23.3.87	D.M. Kissane	M. Lange, A. Honeybourne, N. Broomhall	C.B. Hardie	Cunard Shipping Services Ltd
ACT 6	1.12.87	D.M. Kissane	A.G. Pritchard, S.J. Daniel, S.M. Milner	T.D. Tims	Cunard Shipping Services Ltd
ACT 7	4.2.88	D. Newlin	M. Power, S. Rathbone, P.J. Neve		Blue Star Ship Management Ltd
ACT 8	21.3.88	L.R. Bell	J.J. Millar, D.G. Galbraith		Denholm (I.O.M.)Ltd
Adelaide Express	31.7.87	E.F. Lobo	G. Munjal	M.G. Chitrao	Silver Line Ltd
Al Shamiah	23.10.78	T. Williams	P. Walley		United Arab Shipping Co. (S.A.G.)
Albright Pioneer	16.9.87	J.H. Kitching	D. Thomas, J.V. Davies, S.J. Andrucci	R.J. Shepherd	James Fisher & Sons P.L.C.
Aldrington	14.1.88	D. Patrickson	L.J.A. Gibb, W. Williams, J.M. Reid	T.S. Davies	Stephenson Clarke Shipping Ltd
Alert	3.1.85	A. Chalmers	P. Footman-Williams, C.J. Miners, D.M. Shepherd	J. Vaughan	British Telecom International
Andes	10.11.87	T.R. Barton	M. Richardson, J. Kelly, K.P. Alcock	J. Goldsmith	Furness Withy (Shipping) Ltd
Apapa Palm	21.3.88	E.D. Somes	J.P. Whiteley, S. Brown, N. Whittaker	E.E. Milburn	Ocean Fleets Ltd
Appleby	8.3.88	M.B. Bradley	A.J. Tong, A. Crofts, T.J. Preston	G.N. Shaw	Ropner Management Ltd
Arctic Corsair	8.4.86	B.C. Wharam		A. Spence	Boyd Line Ltd
Arctic Universal	*	P. Ramsden	D. Neaves, A. Ross, R. Thompson	H. Tait	Gateway Shipping Ltd
Asifi	14.3.88	K.E. Hammerman	T. White, M. Shipley		Britship (I.O.M.) Ltd
Astor	11.2.88	W. Klausser	J.D. Kingston, A. MacPherson, N.J.E. Palmour	J. Scott	Morgan Leisure Ltd
Atlantic Amity	11.12.87	C. Bunyan	J. Murray, S. White, T.B. Harris	C. York	Furness Withy (Shipping) Ltd
Atlantic Confidence	22.1.87	M.P. Jellicoe	J.C.P. Brown, R.G. Carnelley, P. Labistour	E.R. Fair	Furness Withy (Shipping) Ltd

Atlantic Conveyor	4.8.87	J.A. Oscroft	A.G. Pritchard, D.A. Smith, A.L. Le Goubin	D.E. Beech	Cunard Shipping Services Ltd
Atlantic Fisher	21.9.82	H. Vane	I.F. Scarr, M.G. Wood, H. McWilliam	A.E.H. Jones	James Fisher & Sons P.L.C.
Atlantic Link	10.3.88	J.H. Lowe	A. Weare, A. Latta, A.G.J. MacPherson	R. Dolby	Ship-Link (U.K.) Ltd
Atlantic Universal	8.1.88	G. Pettingell	R.H. Hutchinson, M.R. Barker, A. Hunter	D. Gavin	Gateway Shipping Ltd
Aurora	*	S.T.S. Household	R. Subramanian, P. Matthews, G. Nichols	J.D. Crasto	P. & O. Lines Ltd
Author	21.3.88	E.J. Maxwell	P.R. Walton, I. Mathison, P.B. Mimmack	W. Starling	T. & J. Harrison Ltd
B.P. Energy	*				B.P. Shipping Ltd
B.P. Harrier	5.6.85	D. Hamilton	P.M. Bowers, I.V. Hawkeswood		B.P. Oil Ltd
B.P. Humber	13.1.88	K.E. Peacock	C.R.D. Soanes, L.G.T. Fisher, R. Holgate	B. Brycki	B.P. Shipping Ltd
B.P. Vigour	7.12.87	A.R. Wilkinson	S. Stjernberg, W.T. Dempsey, S.J. Keitch	P.J. Trant	B.P. Shipping Ltd
B.P. Vision	22.1.88	P. Darlow	C. Mullett, P. Woods. A.D. Wilcock	J. Smith	B.P. Shipping Ltd
Baltic Eagle	8.3.88	D.R. Cripps	M. Kearney, J. Ghest, R.H. Barker	P. Hornby	United Baltic Corp. Ltd
Baltic Progress	4.9.85	R. Kreamer	M. Kearney, B.L. Mullenger, R.H. Parker	D.A. Logan	United Baltic Corp. Ltd
Baltic Universal	26.1.88	J. Foggin	J. Kingston, R.A. Cotton, K.J. Bourne	S. Hunter	Gateway Shipping Ltd
Barbara E	15.2.88	D. Tyler	M. Beeley, M.S. Morgan		Britship (I.O.M.) Ltd
Barber Hector	2.11.87	C.M. Sandy	G.K. Thomson, P. Kypianou, P.W. Hayes	A.G. Thomson	Ocean Fleets Ltd
Barrydale	10.11.87	A.E. Whitehouse	C.R. Darnley, V.V. Akolkar, F.R. D'Souza	F.B. Dumasia	E. & F. Shipping Management Ltd
Bello Folawiyo	5.2.88	J.A.E. Coates	D.A. Littler, V. Williams, O.A. Adeniyi	D. Gunning	Ocean Fleets Ltd
Ben Ocean Lancer	17.6.87	A.I. MacFeate	S.D.R. Campbell, D. Gilmour, T.V. Roberts	H.M.S. Cherry	Ben Line Steamers Ltd
Benalder	29.1.88	J.L. Walterson	I.A. Marshall, M.N. Sherwood, J.A. Inkster	J.S. Hallam	Ben Line Steamers Ltd
Benavon	11.1.88	F.G. Anderson	A.R. Rendle, T.D. Corbett, R.G.C. Noble	J.R. Crockett	Ben Line Containers Ltd
Benhope	1.7.87	T. Fyfe	M. Khanna, T. Corbett, A. Saldanha	K.C. Darvwalla	Ben Line Steamers Ltd
Binsnes	8.3.88	D. Walker	M.J. Court, R.C. Avenin, D.J. Ayling	W. Swann	Jebsens Ship Management Ltd
Birchwood	*	A.P. Hill	M. King, D. Day		Buries Markes (Ship Management) Ltd
Blue Excelsior	23.2.88	D. Hannah	C.J. Shill, I.R. Robinson, P. Peshimam	P. Nottle	Beta Maritime Services Ltd
Bluestream	28.1.88	G.P.D. Coleridge	N.P. Colling, M. Sequeira, M.R. Banon	D.D. Lalchandani	E. & F. Shipping Management Ltd
Bolnes	7.3.88	A.M. Smart	S. Benstead, S.G. Clark, N.W. Conquest	B. Hansen	Jebsens Ship Management Ltd
Bora Universal	29.2.88	F.H. Yeulett	R.E. Lough, I.S. Donaldson, Q.H.A. Alam	D. Colclough	C.I. Shipping Ltd
Botany Bay	9.2.88	R.T. Wood	S. Horne, B.L. Rolf, K.W.S. MacMillan	P. Dolphin	P. & O. Containers Ltd
Bransfield	3.6.87	M.J. Cole	A.M.T. Reading, P.C. Sarjeant, G. Hobbs	R. Wade	British Antarctic Survey
Bridgeman	6.1.87	F. Craske	M.J. McGhee, P.S. Wright, M.D. Kerr	R.I. Gow	Rowbotham Tankships Ltd
British Beech	4.1.88	I. Peterson	R. Donaldson, B. O'Driscoll, D. Stitson	D. Ormrod	B.P. Shipping Ltd
British Esk	4.2.88	J. Thomson	P. Hebden, M.S. Prestt, T.T. Latto	M. Spencer	B.P. Shipping Ltd
British Forth	11.2.88	A.F. Gaunt	J.C.P. Brown, R.H. Booth, R. Brint	P. Clemence	B.P. Shipping Ltd
British Norness	26.10.87	P.N. Johnson	A.A. Facey, S.W. Burton, R.G. Smith	B.A. Goodwin	B.P. Shipping Ltd
British Ranger	3.3.87	J.M. Ronald	C.D. Hindley, C. Winterbottom, J.M. Gibbs	D.A. Richards	B.P. Shipping Ltd
British Reliance	22.11.84	R.A.W. Jarrett	G.R. Snow, S.J. Viney	G.R. Wilson	B.P. Shipping Ltd
British Renown	21.12.87	M.J. Searle	M.A. Watson, D.S. Styles, J. Ramsey	D.W. Bone	B.P. Shipping Ltd
British Resolution	8.1.88	K.G.E Lawrance	C.N. Curran, K. Gregg, K. Patterson	W. Quinn	B.P. Shipping Ltd
British Resource	26.8.87	R.A.W. Jarrett	M.S. Prestt, A.J. Drew	P. Ruddick	B.P. Shipping Ltd
British Respect	9.12.87	R.S. Montague	N.R. Jephcote, P.R. Anderson, E.L. Zapata	G. Jeremiah	B.P. Shipping Ltd
British Security	23.12.87	T. Stones	K. Patterson, D.J. Buckley, I. Blackburn	K. McCarthy	B.P. Shipping Ltd
British Skill	4.1.88	J.Y. MacAlpine	I.C. Massey, J.P. Dunne, W.N. Graham	J. Baldwin	B.P. Shipping Ltd
British Spirit	19.2.88	R.C. Stevens	J.L. Atkins, J.G. Coull, P.A. Ganley	D. Worthy	B.P. Shipping Ltd
British Steel	7.12.87	P. Creber	D.G. Olley, K. Alcock, P.V. Marshall	J. Hetherington	Furness Withy (Shipping) Ltd
British Success	20.1.88	B. Wardman	M. Hopkins, J.B. Dolan, R.J. Atkins	P. Ruddick	B.P. Shipping Ltd
British Tamar	15.2.88	P.T. Morris	N.J. Collins, S. Davies, E.R. Davis	M. Wakelin	B.P. Shipping Ltd

Selected and Supplementary Ships *(contd)*

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
British Tay	28.1.88	M.R. Mansbridge	E.L. Nicolaysen, D.R. Attrill, B. Pereira	I.M. Clarke	B.P. Shipping Ltd
British Tenacity	13.11.87	D. Allan	L.L. Wallace, W.A.J. Cameron, C.R.D. Soanes	D.C. Ogden	B.P. Shipping Ltd
British Trent	25.11.87	F. Wilkinson	K. Kitchen, R.L. Horne, D.M. Hopkin	A. Grant	B.P. Shipping Ltd
British Trident	15.2.88	J.O. Bailey	S.R. Mitchell, R.A. Hawkins, A.M. Lakey	B. Bryki	B.P. Shipping Ltd
British Wye	9.2.88	K. Meacock	S.M. Duncan, D.J. Williams, T.C. Moore	S.A. Weber	B.P. Shipping Ltd
Broompark	16.9.87	S.H. Baker	M.S. Babu, H.S. Shetty, V.R. Nair	V. Meghani	Denholm Ship Management Ltd
Buffalo	10.11.87	R.H. Saunders	B. Woodward, S.H. Hanson, K.P. Riley	C.S. O'Sullivan	P. & O. Ferries Ltd
C.G.M. Provence	14.3.88	D. Skillander	G.A. Walter, N.A. Jardine, A.J. Sharpe	F. Farthing	T. & J. Harrison Ltd
Cable Protector	*	E.E. Turner	P.S.D. Worrall, R. Malcolm		Cable & Wireless P.L.C.
Cable Venture	15.6.87	J.G. Paterson	R.S. Merritt, F.J. Hill, P.R. Bryant	R.A. Perry	Cable & Wireless P.L.C.
Cableman	6.1.86	J.H. Bates	N.A. Lovesy, H.A. Williams	R.R. Hughes	Rowbotham Tankships Ltd
Canada's Tomorrow	*				Canada's Tomorrow Discovery Corp.
Canadian Explorer	1.2.88	T.N. O'Driscoll	I.M. Wright, G.M. Webster, K.S. Harnett	F. Fletcher	Furness Withy (Shipping) Ltd
Canberra	23.2.88	M.V.N. Bradford	A.R.L. Herriott, C.B. Lye, P.S. Martin	J. Gawley	P. & O. Lines Ltd
Canmar Ambassador	21.12.87	R.K. Prakel	M.G. Weir, D. Collier, J.E. Whitley	J. Lyttle	Canadian Pacific Steamships Ltd
Canmar Venture	8.9.87	A.C. Matthews	M.G. Weir, P.E. Jolley, T.J. Blatchley	D. Robinson	Canadian Pacific Steamships Ltd
Canterbury Star	22.12.87	H.K. Dyer	P. Richards, K.A. Sykes, M. Ellis	S. Shayes	Blue Star Ship Management Ltd
Capricorn	20.6.86	Trachanas Dimitrios	Hatzipetros Nikolaos	Koytoyfaris Ioannis	Kappa (Maritime) Ltd
Cardigan Bay	10.3.88	R.J. Bland	M. Moore, J. Williamson, G.M. Davis	P. Mathews	P. & O. Containers Ltd
Cartagena	20.1.88	D.S. Ritchie	G. Penales, S.A. Sulit, O.J. Logronio	O.N. Celis	Denholm Ship Management Ltd
Cast Husky	14.5.87	E. Williams	M.F. Orchard, B. Norton, C. Morrison	D. Cowhig	Cast (1983) Ltd
Cast Muskox	6.3.87	D.S. Ritchie	J.M. Rowe	F. Campbell	Cast (1983) Ltd
Cast Otter	1.7.87	D.S. Ritchie	R. Gribben, J.J. Millar, R.G. Valentine	N. Long	Cast (1983) Ltd
Cedarwood	*	S.L.L. Buckley	I. Nicholson, H. Nutt, A. Hall		Buries Markes (Ship Management) Ltd
Celtic Ambassador	30.11.87	M.R. Gadd	J. Aynsley, A.P. MacLean, A. Speed		C.M. Willie & Co. (Shipowners) Ltd
Celtic Challenger	26.10.87	M.R. Harris	C.J. Hughes, N.R. Parker. P.A. Kelly		C.M. Willie & Co. (Shipowners) Ltd
Celtic Link	18.2.82	H. Gray	H.W. Stewart, S. Duncan	D.N. Barlow	Ben Line Steamers Ltd
Celtic Mariner	19.2.88	C.J. Hughes	M.E. Winter, E.K. Andoh-Wilson, B.A. Hoyle		C.M. Willie & Co. (Shipowners) Ltd
Celtic Voyager	17.12.87	J. Munday	A.P. MacLean, C.O. Namurach		C.M. Willie & Co. (Shipowners) Ltd
Challenger	15.3.88	M. Harding	E. Dowell, N.A.C. Jonas, S.J. Bagshaw		Natural Environment Research Council
Charles Darwin	4.1.88	S.D. Mayl	A.R. Louch, S. Sykes, G. Proctor	J.G.L. Baker	Natural Environment Research Council
Chelsfield	7.3.88	J.W. Sutton	D.A. Lemon, P.J. Bruce, G. Ranganathan	P. Sloan	Buries Markes (Ship Management) Ltd
Churchill	22.12.87	J.F. Rowe	M. Locke, S.R. Pridmore, M.J. McMahon	M. Morgan	Blue Star Ship Management Ltd
Cirolana	7.4.87	G. Sinclair	G.R. Oliver, B.A. Chapman, R. Woodhouse	R. Baty	Ministry of Agriculture, Fisheries & Food
City of Edinburgh	29.2.88	M.P. Tennant	T.V. Roberts, J. Clark, P.D. Gauld	N. Barlow	Ben Line Containers Ltd
City of Plymouth	21.3.88	K.F. Steven	C.A. Campbell, G.E. Harvey, N.M. Crouther		Denholm (I.O.M.) Ltd
Clare	2.4.86	C. Schiller	M.S. MacColl, P.K. Paterson	D.W.B. Kellas	Furness Withy (Shipping) Ltd

Claymore	11.8.87	J. Campbell	M.B. Scott, C. McCurdy, D.M. Richmond	W. Ward	Caledonian MacBrayne Ltd
Clydebank	22.7.87	A.T. McGregor	R.G. Penhaligon, P.T. Thompson, A.J. Yeaman	P.A. Lindley-Curtis	Bank Line Ltd
Cordoba	*	R.I. Crawford	J. Coleman, S. Ruiz, E. Walmsley	S. Pinch	Cardiff Ship Management Ltd
Dahlia	20.1.88	R.G. Stollery	D. Thompson, R. Hood, J.W. Goddard	J. O'Sullivan	Beta Maritime Services Ltd
Dallington	22.4.86	R. Thompson	D.W. McAlpine	I. Blenkinsopp	Stephenson Clarke Shipping Ltd
Dart America	16.12.87	R.I.G. Calder	I. Foster	J. Magee	Furness Withy (Shipping) Ltd
Dart Atlantic	*	N.R. Pryke	D.R. Sanders, R.S. Daya, T. M'Harry	P. Keen	Furness Withy (Shipping) Ltd
Dart Europa	*	N. Halliwell	D. Nixon, P. Galear,T. M'Harry	J. Magee	Furness Withy (Shipping) Ltd
Dawpool	30.9.87	J.A. Chapman	Shakeel Azim, R.M. Thomas		C.M. Willie & Co. (Shipowners) Ltd
Devonshire	15.3.88	F.R.F. Martin	W.J.M. Hargreaves, D. Hughes, G.H. Dennis	B. Foley	Bibby Line Ltd
Discovery	3.12.87	G. Long	B. Richardson, P.T. Oldfield, R.H. Ginger	B. Donaldson	Natural Environment Research Counci
Discovery Bay	9.2.88	B.V. Chipperfield	R. McLarty, I.S. Norris, N.P. Woodhead	B. Matten	P. & O. Containers Ltd
Donnington	31.3.87	W.G. McNaughton	K.J. Monday, A. Bourne	I. Blenkinsopp	Stephenson Clarke Shipping Ltd
Drupa	16.9.87	H.J. Tibbs	N. McNab, J. Evans, R.B. Webb	T. Lee	Shell Ship Management Ltd
Durrington	3.9.87	D. Patrickson	M. Knight, H. Gunton, S. Laskey	A. Facey	Stephenson Clarke Shipping Ltd
Earl Granville	30.10.84	M.G. Mills	B. Hayball, P. Goode, P. Harris	P. Jordan	Sealink (U.K.) Ltd
Eastella	5.1.88	R. Jowett	G. Tully, G. Paskell, N. Amery	E. Wheale	J. Marr & Son Ltd
Ebalina	30.11.87	W.N. Bradbrook	G.J. Barber, A.W.S. North, D. Copeland	D.H. Parkes	Shell Ship Management Ltd
Eburna	11.2.88	B.B. Beale	E. Mullin, G.D. Nicholls, P.J. Grant		Shell Ship Management Ltd
Echoman	6.5.87	I. Storie	M. Thomason, G.H. Beaumont, J.W. Wilson	G. Duffield	Rowbotham Tankships Ltd
Edinburgh Talla	*	H.G. Gray	M. Murray, C. Tomlinson, J.S. Phillips	B. Prynn	Ben Line Steamers Ltd
Edmonton	*				Canadian Pacific Steamships Ltd
Elgurdabia	6.8.86	J.W. Niblock	R.J. Bridge, M.E. Lacey, S. Westrip	A.G. Thomson	Manx Ship Management Ltd
Elizabet	17.12.87	L.G. Relton	G.F. Lack, T.S. Moseley		Hudson S.S. Co. Ltd
Elk	11.2.88	B. Luke	K. Riley, P. Brookes, G.P. Dawson	R. Stewart	P. & O. Ferries Ltd
Encounter Bay	13.1.88	D.J. Robertson	D. Tracey, R. Moxon, P. Bowen	C.Y. Constantinou	P. & O. Containers Ltd
Endeavour	18.12.87	I. Beetham	D.J. Pratt, I. Cowan, C.M. Ashton	N.B. Thomson	Souter Shipping Ltd
Entalina	9.11.87	W. Hemming	A. Whiteley, C. Atherton, N.J. Walker	A. Fielding	Shell Ship Management Ltd
Enterprise	7.3.88	R. Carr	R. Taylor, N.E. Blythe, P.C. Harris	R.V. Stevens	Souter Shipping Ltd
Equinox	20.1.88	G.C. Sandercock	K.G. Webb, S. Sowerby, P.A. Lanaghan	C.A. Dillon	Souter Shipping Ltd
Erinna	29.2.88	H.L. Graham	K. Daubner, M. Watts, U.E. Hall	M.A. O'Brien	Shell Ship Management Ltd
Ervilia	11.12.87	J. Rafferty	A.D. Lowrey, J.G. Tarling, A.W. Batten	N.A. May	Shell Ship Management Ltd
Esplanade	29.2.88	R.L. Andrews	J. Greig, I.G. Robertson	F. Wilson	Souter Shipping Ltd
Esso Aberdeen	21.3.88	T. Ramsey	W.B. Wilson, R.L. Law, M. Hustwith	A. Turner	Esso Petroleum Co. Ltd
Esso Demetia	1.2.88	A.J. Washbourne	J. Peel, B. Pickaver, K.H. Milne	A. West	Esso Petroleum Co. Ltd
Esso Tees	7.10.87	J.W. Aalen	J. Holmes, P.Q. Rees. A.C. Lowe	G.O. Szymanski	Esso Petroleum Co. Ltd
Esso Warwickshire	20.10.87	S.J. McCollin	K.H. Milne, I.M. Roberts, M. Hustwith	P. Birt	Esso Petroleum Co. Ltd
Etrema	5.2.88	D. Sloan	B. Palmer, A. Hammond, C. Durman	A.C. Cook	Shell Ship Management Ltd
Eulima	29.2.88	A.D. Straight	J. Urquhart, A. Surey, J.D. Price	J. Connelly	Shell Ship Management Ltd
Euplecta	26.11.86	J. Grisdale	D.S. Warren, S. Mathews, J. Ruffell	J. Murgatroyd	Shell Ship Management Ltd
Europa Point	23.12.87	J. Wood	M. Gulzar, M. Zakir	M. Akhtar	Acomarit (U.K.) Ltd
Eye of the Wind	12.1.83	R.S. Grono			Adventure under Sail
Falcon Arrow	26.8.87	S.R. Brown, C.H.C. Knight	S.J. Kelsall, Chow Man Wai	W. Hughes	Jardine Ship Management Ltd
Falklands Desire	15.2.88	J.C. Jones	W.E. Lewis, R.N. Amery, O.M. Lynch	R. Wilkinson	J. Marr & Son Ltd
Falklands Right	*	T. Barkworth	B. Wilson	R. Wilkinson	J. Marr & Son Ltd
Farland	10.3.88	R.J.A. Copeland	D.J. Vickery, I.C. Gravatt, R.J. Inge	P. Kilbane	Ropner Management Ltd

Selected and Supplementary Ships *(contd)*

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Farnella	8.12.87	M. Paterson	J. Davies		J. Marr & Son Ltd
Farnes	4.6.87	D. Clements	I. Connors, S. Clark, C.W. Milne	A. De La Grense	Jebsens Ship Management Ltd
Festival	4.1.88	N.H. Siraj	A.H. Zubair, M. Azmatullah, S.A. Ali	M.A. Rana	Gulf (Shipowners) Ltd
Fleetwave	22.10.87	C.J.B. Trinick	W.A. MacRitchie, J. Kapur, G.S. Gill	K.K. Pandit	E. & F. Shipping Management Ltd
Flinders Bay	21.1.88	D.A. Dornom	B. Graham, N. Copeman-Mitchell, J.R. Roberts	E.B. Stephenson	P. & O. Containers Ltd
Fort Assiniboine	30.11.87	J.S. Rind	D.F. Shepherd, P.G. Cole, C.D. Rossel	D.R. Jelley	Canadian Pacific Steamships Ltd
Fort Dufferin	11.2.88	P. Moore	C.J. Ireland, H.K. Nagpal, P. Upadhyay	S.P. Raje	Canadian Pacific Steamships Ltd
Fort Frontenac	17.6.87	H.L. Kinns	G. Moir, P.B. Frost, R.O. Jolliffe	R.V. Quennell	Canadian Pacific Steamships Ltd
Fort Garry	26.1.88	D.P. Cockrill	A.J. Bentley, S.C. Breton, R.O. Jolliffe	T. Verling	Canadian Pacific Steamships Ltd
Fort Kipp	21.3.88	B.M. Jones	D. Strangeway, S.M. Horan, G.B. Clement	A.C. Bell	Canadian Pacific Steamships Ltd
Fort MacLeod	7.7.86	G.S. Oakley	S.J. Hutty, S.M. Collins, H.R. Niblock	R. Brien	Canadian Pacific Steamships Ltd
Fort Providence	13.1.88	D.O. Tourell	R.M. Ellsmoor, P. Ranjan, F.A. D'Mello	M. Panindre	Canadian Pacific Steamships Ltd
Fort Resolution	24.12.87	J.N. Travers	S.R. Thapar, M.J. Clark, N.S. Shere	B. Viegas	Canadian Pacific Steamships Ltd
Fort Rouge	4.11.87	W. Estill	K. Brothers, C.D. Russell, P.N. Brant	H.M. McGrory	Canadian Pacific Steamships Ltd
Fort St John	11.3.87	A. Stobbs	G.D. Weaver, J. Dalisay, M. De Filipe	A. Lagrido	Wallem S.M.S. (I.O.M.) Ltd
Fort Steele	5.1.88	M. Allen	N.P. Bradshaw, K. Doyle, M.W. Jubb	P.R. Howard	Canadian Pacific Steamships Ltd
Fort Toronto	2.10.87	D.P. Cockrill	R. Musgrove, D.J. Faulkner, I.G. Swales	R.E. Haviland	Canadian Pacific Steamships Ltd
Forthbank	13.1.88	D.L. Jones	D. Ginder, P.T. Thompson, G.R. Armstrong	S.H. Hollingworth	Bank Line Ltd
Fremantle Express	8.3.88	C.G. Bhoot	V. Gupta, M.K. Luthra, R.K. Bhoot	P.S. Hans	Silver Line Ltd
Frio Chile	*				Lomar Shipping Ltd
G.A. Walker	7.10.87	G.S. Oakley	E. Farquharson, M.A. Beviss, T. Edwards	P. Hemmerman	Canadian Pacific Steamships Ltd
Ga Chau	2.4.86	H. Connell	A.E. Regan, J.P. Martlew, D. Paul	S.A. Lamb	Denholm Ship Management Ltd
Gardline Locater	7.3.88	I.W. Crane	K. Scott, J.W. Graham		Gardline Shipping Ltd
Gas Enterprise	16.3.88	M. Salmon	D. Lewis, A.M. Smith, D.W. Pritchard	P. Kielthy	B.P. Shipping Ltd
Geestbay	3.12.87	D.N. Boon	D. Buckingham, J.R. Parfitt, C.M. Davies	P.A. Lindley-Curtis	Geest Line Ltd
Geestcape	7.1.88	G. de F.Foster	D. Roberts, D. Buckingham, E.J. Hooper	T.M. Williams	Geest Line Ltd
Geesthaven	13.7.87	G. McDonald	D. Roberts, E. Gander, S. Allen	A. Steel	Geest Line Ltd
Geestport	25.9.87	C. Flanagan	J.H. Worwood, K.B. Henry, J.R. Parfitt	T. Baxter	Geest Line Ltd
Glenavon	*	A. Phillips	B. Padfield, P. Hackwell, M. Windows		Wessex Water
Gold Varda	30.10.85	R.M. Mitchell	R. Borkowski, S.J. Windle, R. Ross	D.H. Logie	Haverton Shipping Ltd
Golden Fleece	21.3.88	A. Mair	C.S. Swarnakar, S.R. Sukhrani, R. Kapuria	P. Srikant	Ugland Bros. Ltd
Graiglas	1.12.87	E.M. Holmyard	D.G. Wigmore, M.R. Gover, N. Hawkes	P.K. Short	Garth Shipping Co. Ltd
Graigwerdd	*				Garth Shipping Co. Ltd
Hampshire	18.1.88	C.O. Thomas	R.J. Court, D.C. Gilbert, M. Pithie	G. Simpson	Bibby Line Ltd
Harefield	21.1.88	K. Moger	R.J. Dockett, M.J. Jubb, L.H.R. Fernando	P. Hurst	Buries Markes (Ship Management) Ltd
Harlech	*	N. Passey	Uday Bhandarkar, C.Y.S. Nath, G. Vurgese	N. Tripathy	Blue Star Ship Management Ltd
Harold La Borde	11.2.88	J.S. Gavin	S.L.J. Walker, R.A.C. Smelt, A.W. Bissaker	P.N. Pouchet	Bibby Line Ltd

Havdrott	3.3.88	J.D. Owen	J.D. Hogg, T.H. Paterson, A. Capadosa	W. Ryan	Myhre Havtor (U.K.) Ltd
Havjarl	5.1.88	A.D.G. Bell	H. Pollard, C.R. Pratt, M.G. Dalman	K.S. O'Sullivan	Myhre Havtor (U.K.) Ltd
Havkong	14.1.88	R. Tanguy	K.I. Mockett, C.W. Pollard. R.B. Vitales	K.R. Grattan	Myhre Havtor (U.K.) Ltd
Hebridean Isles	23.9.87	M. Kennedy	T.G. Moore, I.F. Scarr, D.G. Malcolm	W. Ward	Caledonian MacBrayne Ltd
Hekabe	4.11.86	D. Heaselden	J. Moulds, R.P. Willis, K.M. Haley, N. Vause	M.B. Smith	Myhre Havtor (U.K.) Ltd
Helikon	30.11.87	P.R. Dew	S. Harvey, B. Pritchard, A. Esmael	P. Whyley	Myhre Havtor (U.K.) Ltd
Hermina	4.6.87	P. Beresford	S. Perrins, G.R. Phillips, T.N. Ferguson	B.T. Davis	Myhre Havtor (U.K.) Ltd
Hermod	15.6.87	B. Godtchack	W. Mathieson	J. Revet	Myhre Havtor (U.K.) Ltd
Hesiod	20.11.86	M.J. Carter	A.J. Whitcher, W.D. Phimister, S. White	R.J. Leeds	Myhre Havtor (U.K.) Ltd
Highland Reel	8.4.87	C. Green	D. McIntyre, G. Collier, D.J. Cowie	D. Gavin	Ugland Marine Ltd
Hoegh Duke	4.2.88	P. Matthews	P. Holtby, R. Morrison, G.S. Colenutt	N. Marwood	Blue Star Ship Management Ltd
Horncliff	21.3.88	W.J.G. Jones	J.R. Benson, S.R. Pridmore, N.J. Barr	R.J. Evans	Blue Star Ship Management Ltd
Hornsea	8.1.88	C.I. MacKillop	W. Houghton-Boreham, S. Ross, L. St J. Campbell	N. MacLean	Blue Star Ship Management Ltd
Humanist	4.1.88	A.G. Brown	B.G. Gnananayagam, J.B. Anton, S.I. Chowdhury	Y. Rangarajan	Ocean Tramping Ltd
Hupeh	29.2.88	J.H. Gomersall	C.C. MacDonald, Lee Lye Eng, G.F. Rechenberg	P.A. Swire	Chins Nav. Co. Ltd
Ibn Abdoun	15.12.87	A. Gupta	H.S. Sant, P. Verma, N. Jarrar	S.K. Datta	United Arab Shipping Co. (S.A.G.)
Ibn Rushd	8.4.87	P.W. Roberts	A. Suddaby, Hisham Almajali, M.A.K. Ibrahim	M. Patten	United Arab Shipping Co. (S.A.G.)
Iolair	18.2.88	D. Rundle	R. Greenwood, D. Vann, J. McIntyre	C. Wandsworth	B.P. (Pet. Dev.) Ltd
Irma M	8.3.88	N.W. Thomas	M.J. Davies, P.P. Singh, A.J.P. Pinto	R. Dutta	E. & F. Shipping Management Ltd
Iron Bridge	16.3.88	N.L. Matthews	J. Kelly, D. Olley, A. Rowe	G.S. Graham	Furness Withy (Shipping) Ltd
Isle of Arran	14.3.88	J.S. Ellis	T.G. Wilson, L.M. O'Keefe, A.J.T. Gray		Caledonian MacBrayne Ltd
Isocardia	4.1.88	J.G. Peace	S. Galloway, R. Collier, P. Brown	R.J.E. Chapman	Shell Ship Management Ltd
Isomeria	10.9.87	E. Wilkinson	C. Johns, N. Johns, D. Wardle	M. Adams	Shell Ship Management Ltd
Iver Champion	17.4.85	G. Milburn	F.H. Heath, A.M. Stobbs	R.P. Billett	Wallem S.M.S. (I.O.M.) Ltd
Ivybank	5.1.87	E.T. Rees	C.C. Baines, C.N. Hardy, D.T. Wells	J.C. Yates	Bank Line Ltd
Jasmine B	1.7.87	P.J. Wright	K. Dickinson, J. Holloway	M.J. Hogan	Beta Maritime Services Ltd
John Biscoe	16.4.87	C.R. Elliott	J.R. Harper, R.C. Plumley, P. Kerry	D.J. McCrohan	British Antarctic Survey
Jostelle	22.1.88	J. Burt	K.A. MacLeod, P. Thompson, P.V. Curran	P. Byers	Souter Shipping Ltd
Keta Lagoon	15.3.88	S.D.K. Kpe	F.A. Koranteng, J. Arthur, J. Owusu-Koranteng	S.E. Mensah	Black Star Line Ltd
Kildare	21.3.88	P.J. Wild	A.K. George, D.C. Winter, R. Singh	A. Chattopadhyay	P. & O. Lines Ltd
Kingsnorth Fisher	19.11.86	T. Wright	A. Tattersall, K. Lockhart, A. Hood	D.R. Woods	James Fisher & Sons Ltd
Kowloon Bay	29.1.88	J.S. Thorpe	N.P. Woodhead	G.Scullion	P. & O. Containers Ltd
La Chacra	3.3.87	J.D. Robinson	R.M. Patmore, D.J. Heale, C.A. Bates	P.R. Lacock	Buries Markes (Ship Management) Ltd
La Pampa	14.3.88	J.M. Waller	M. Johnson, C.W. Blacker. J.H. Donne	T.E. Lowe	Buries Markes (Ship Management) Ltd
Lackenby	18.2.88	T. Armstrong	P. Wylie, R.J. Inge	K.S. Woodley	Ropner Management Ltd
Lairg	15.2.88	A.W. Kinghorn	S.G. Mortimer, A.M. Lee. J.S. Latto	D.R. Pickler	Blue Star Ship Management Ltd
Lakenes	4.11.87	C. Thomson	D.L. Brown, S. Doughty, S.J. Adey	G. Robertson	Ropner Management Ltd
Lampas	18.1.88	T.P. Hughes	C.S. Scott, I. Kendall, A.C. Davis	B. Mullally	Shell Ship Management Ltd
Lanark	3.12.87	M.J. McGilvray	N.C. Davidson, A. Pitcher, D. Rae	D. MacIver	Blue Star Ship Management Ltd
Lancashire	*				Bibby Line Ltd
Lancasterbrook	17.2.87	I. Anderson	S.D. Clarke, D.A. Hughes		F.T. Everard & Sons Ltd
Lantau Trader	16.12.87	E. Williams	Ho King Pui, Chan Siu Wam	L.L. Fernandes	Denholm Ship Management (Overseas) Ltd
Lavender	11.12.87	J. Blaber	C.I. Stenning, I.R. Robinson, R. Hood	M.J. Hogan	Beta Maritime Services Ltd
Leicesterbrook	11.8.86	J.J. Myles	W.G.S. Williams, C.G. Buckley		F.T. Everard & Sons Ltd
Leonia	18.2.88	P. Sayers	R.J. Payne, J. East, B. Blythe	D. Fry	Shell Ship Management Ltd

Selected and Supplementary Ships *(contd)*

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Lerma	16.3.88	M.J. Bellamy	R.P. Eastham, J.P. Andrews, Q.G. Morgado	K.H. Sellar	Cardiff S.M.S. Ltd
Leslie Gault	25.4.86	R. Phillips	D.A. Wilkinson, I. Spence	D.M. Healey	Denholm (I.O.M.) Ltd
Lima	3.3.88	D.J. Conway	A.F. Devanney, C. Finlayson, R. Mellor	M. Gamble	Shell Ship Management Ltd
Lincolnshire	20.1.88	J.K. Allison	D. Brown, C.J. O'Brien, C.I. MacLeod	B. Dickinson	Bibby Line Ltd
Liverpool Bay	9.2.88	A. Palmer	A. Baker, J. Stoneley, P.A. Chalmers	R. Goring	P. & O. Containers Ltd
Liverpool Star	21.3.88	J.A. MacLeod	R. Collins, D.A.K. Bamford, J. Foley		Denholm (I.O.M.) Ltd
London Spirit	21.9.87	D.S. Wyllie	M.C. Littlewood, S. Tierney, M.A. Pearce	I.F. Alexander	London & Overseas Freighters P.L.C.
London Victory	4.1.88	E.G. Humby	R.E. Mayman, C.A. Cornish, M.J. Webber	C. Stuart	Furness Withy (Shipping) P.L.C.
Lord Nelson	*	J. Fisher	D. Neale, J. Clay, J. Green		Jubilee Sailing Trust Ltd
Lucerna	23.12.87	G.J. Ward	D.S. Hughan, J.H. Howe, R.M. Hopper	N. Matthews	Cunard Shipping Services Ltd
Lumiere	23.7.87	C.D. Croalt	P.R. Kaye, P.C. Youe, I.J. McMahon	B.C. Miller	Cunard Shipping Services Ltd
Luminence	24.4.87	B.D. Fern	H.J. Everington, H.J. Pugh		Crescent Shipping Co. Ltd
Luminetta	7.1.88	J.B. Watson	B.J. Garside, P.R. Lawrence, P.A. Squance	M. Humphreys	Cunard Shipping Services Ltd
Maersk Cadet	21.12.87	K.B. Lowery	S.H. McNiven, G.R. Wise, T.A. Brown	D. Williams	Britship (I.O.M.) Ltd
Maersk Gannet	19.2.88	S.R. Lyons	C.P. Howard, J.P. Rumsby, P.G. Bowett	D.J. Busveids	Britship (I.O.M.) Ltd
Maersk Harrier	16.10.87	G. Daykin	L.E.A. Martin, A. Mathieson, G. Whitehead	G. Smith	Britship (I.O.M.) Ltd
Maersk Navarin	*	W. Frazer	J.W. Blake, C.A. Nugent, J.L. Burton	C.F. Taylor	Britship (I.O.M.) Ltd
Mairangi Bay	22.1.88	C.B. Walgate	C. Henderson, R.J. Faithful, S.R. Paine	M.R.T. Hannan	P. & O. Containers Ltd
Mairi Everard	24.4.87	L.A. Davis	B.R.F. Cox	W.J. Strafford	F.T. Everard & Sons Ltd
Manchester Challenge	18.1.88	C.W. Sturcke	L. Mitchell, G. Leggett, J.L. McCorquodale		Furness Withy (Shipping) Ltd
Mark - C	16.9.87	W.G. Kingwood	M. Gilbert, T.G. Dainty, M.J. Hawkes		Carisbrooke Shipping Ltd
Matco Avon	9.12.87	P.D. Kelly	K. Gill, C.R. Booker, A.J. Robinson	E. Harle	Mobil Shipping & Transportation Co.
Matco Clyde	23.2.88	D.A. Platt	M.H. Case, A.J. Anderton, C.N.A. Macey		Mobil Shipping & Transportation Co.
Matco Thames	15.3.88	C. Mottram	N.J. Cooke, P.A. Edwards, C.J. Graham	P.E. McMahon	Mobil Shipping & Transportation Co.
Mediterranean Shearwater	1.10.87	F.P. Garbutt	J.M. Stafford, A.J. Howlett, K.M. MacDonald	S.J. Thewlis	James Fisher & Sons P.L.C.
Melampus	15.2.88	E.J. Watterson	A. Warren, A. Houghton, P.A. Carmichael	C. Wade	Ocean Fleets Ltd
Melton Challenger	15.2.88	J. Beck	N.M. Sly, S. Rogers, R.J. Duff		Melton Shipping Co. Ltd
Memnon	16.11.87	B.N. Jones	S. Thomson, B. Martins, T. Sinclair	R. Buckles	Ocean Fleets Ltd
Menelaus	21.3.88	H. McCole	M.M. MacLeod, A. Brown, J.L. Wilson	M.R. Palmer	Ocean Fleets Ltd
Merchant Pioneer	11.11.87	J.R. Corrin	A.J.C. Braganza, R. Dabral, S.P.S. Rantela	A.N. Monserrate	Denholm Ship Management Ltd
Merchant Prelude	13.1.87	A. Zarniewicz	Z. Kusnierz	S.T. Sloczynski	Denholm Ship Management Ltd
Merchant Principal	4.1.88	R.W. Cotter	G. Singh, N.F.H. Printer, T.S. Bajwa		Denholm Ship Management Ltd
Monarch	30.6.87	J. Newbury	C.C. Broadbridge, G.W. Renshaw, R.M. Hughes	J. Vaughan	British Telecom International
Montarik	5.10.87	A.J. Evans	A. Nazir, M.R. Islam, T. Karamat	M. Ismail	Acomarit (U.K.) Ltd
Moraybank	8.3.88	P.J. Elder	J. Osman, B. Stirling, A.L. Jeffrey	K. Brown	Bank Line Ltd
Moreton Bay	3.3.88	I.S. Grant	C.J.A. Hughes, W.J. Stoker, M. Barraclough	T.J. Smith	P. & O. Containers Ltd
Mulbera	8.7.87	A.J. Chivers	A.J. Brown, D.G. Robbie, M. Ellis	T. Baxter	Blue Star Ship Management Ltd

Nassau Pride	15.2.88	J.A. Coffin	F.J. Nichol, C.J. Slade, R.W. Thomson	J.H. Kell	Garth Shipping Co. Ltd
Naticina	25.11.87	J.G. Ruffell	G. Wilkinson, G.M. Hill, J.W. Wibberley	B. Prynn	Shell Ship Management Ltd
Neptune Jasper	8.3.88	K. Yin	T. Sein, V.R. Bali	K. Zwa	Neptune Orient Lines Ltd
Nickerie	11.1.88	P.G. Pinkerton	M.J. Lobo, P.C. Williams, R.R. Kamat	D. Divgi	E. & F. Shipping Management Ltd
Norna	*	S. Lockhart	J. Barkess, H.A. MacKenzie, A. Collins		Dept of Agr. & Fish. for Scotland
Norrisia	21.3.88	D.L. Davidson	B.R. Horsburgh, C.J. Wood, D. Pegg	T. Kennedy	Shell Ship Management Ltd
Norsea	*	D. Wharton	M. Topping, K. Appleton, P. May, D. Collins		North Sea Ferries Ltd
Nortank Fighter	*	B. Firth	P. Kohli Rajender, P. Malone, D. Bhathena Firdaus	A.F. Marques	Silver Line Ltd
Northern Explorer	28.1.87	M. Thomson	F.W. Brown, D. Farrington, I.A. Patterson	R. Boatman	Denholm Ship Management Ltd
Northern Horizon	*	P. Taylor	P. Garner, A. Fuller		J. Marr & Son Ltd
Northern Venturer	*	K. Mair	P. Tippett, D. Lemon	R. Selkirk	Davy Normanby Ltd
Northia	14.3.88	B.B. Pearson	J.R. Evans, P. Lockie, D. Butters	W.N. Greene	Shell Ship Management Ltd
Nosira Lin	9.12.87	J. Milner	B.R. Tucker, P.W. Newton, R.K. Harding	S. Potter	Bolton Maritime Management Ltd
Nosira Madeleine	15.6.87	J. Milner	C. Cooke, J.C. Theaker, B.M. Reilly	A.E.H. Jones	Bolton Maritime Management Ltd
Nosira Sharon	22.12.87	S.F. Williams	S. Kembery, D.S. Hibberd, P.F. Goodchild	M.G. Finn	Bolton Maritime Management Ltd
Oakwood	*	P.R. Lea			Buries Markes (Ship Management) Ltd
Oil Hustler	*	N. Brown	L. Elms		Ocean Inchcape Ltd
Orchid B	*	R.D. Berryman	N.P. Truelsen, P.K. Thahur, R.L. Redding	B. Johnson	Beta Maritime Services Ltd
Ormond	20.10.87	D.F. Heaselden	D. Kapoor, A. Dockeray, S.L. Pradhan	R.A. D'Souza	P. & O. Ship Management Ltd
Osaka Bay	15.2.88	J.K. Blackburn	J.G. Dixon, B.J. Coupland, D.P. Crowley	S.R. Cloutte	P. & O. Containers Ltd
Pacific Crane	15.3.88	D. Marr	M. Grimshaw, M. Morris, N. Turnbull	G. Swainbank	James Fisher & Sons P.L.C.
Pacific Guardian	31.7.85	P.R. Shaw	J.A. Tollady, W. Marr	S. Haslett	Cable & Wireless P.L.C.
Pacific Pintail	*				James Fisher & Sons P.L.C.
Pacific Prestige	15.2.88	P.A. Miley	J. MacKenzie, J. Nutter, M. Arif	J. Morrissey	Furness Withy (Shipping) Ltd
Pacific Sandpiper	16.3.88	J.L. Lundberg	D. Ilderton, P.A. Booker, N. Dilkes	T. McMahon	James Fisher & Sons P.L.C.
Pacific Swan	15.3.88	A.G. Lacey	M.J. Stares, J.A. Strathearn, T. Bannister	D.A. Drummond	James Fisher & Sons P.L.C.
Pacific Teal	11.11.87	F.P. Garbutt	R.G. Flynn, J.P. Allan, T.I. Dixon	P. Austen	James Fisher & Sons P.L.C.
Pacific Universal	21.5.87	T. Abbott	G. Pettingell, R.A. Cotton, A. MacPherson	D. Williams	Gateway Shipping Ltd
Pegasus	20.6.86	Kaloudis Anastasios	Kossenas George	Kalodimos Kypiakos	Kappa (Maritime) Ltd
Perseus	*				Kappa (Maritime) Ltd
Petersfield	13.11.87	J.W. Gurton	M.J. Walker, P.J. Bruce, K. Lindsay	P.T. Mangleshot	Buries Markes (Ship Management) Ltd
Pholas	27.3.86	J. Steel	D.T. MacDonald, J. Downie		Coe-Metcalf Shipping Ltd
Pointsman	28.1.87	R. Ord	D.A. Eagles, R.O.M. Low, J.D. Shelley	G.M. Duncan	Rowbotham Tankships Ltd
Pole Star	3.1.79	N. Morrison	W. Tullock, A.B. Welch		Northern Lighthouse Board
Pomella	21.10.87	H.M. Clifford	P.I. Jameson, J.F. Meredith, G.A. Szuk	A.C. Bishop	Shell Ship Management Ltd
Profiler	*				Gardline Shipping Ltd
Providence Bay	29.1.88	W.F. McCarthy	S.M. Conran, J.L. Peterson, A.E. Howard	J.C. Thompson	P. & O. Containers Ltd
Puma	26.8.86	E. Wildgoose	D. McNaughton, J.T.. Jamieson	P.D. Sutcliffe	P. & O. Lines Ltd
Queen Elizabeth 2	21.12.87	A.C. Bennell	C. Balls, J.H. Barwis, I. McNaught	P. Marriot	Cunard Shipping Services Ltd
R.A. Emerson	21.12.87	K. Elias	G.M. Begley, P.E. Jolley, S.J. Hutty	T. Bousefield	Canadian Pacific Steamships Ltd
Rapana	22.10.87	G.J.T. Drummond	S.R. Holt, J.D. Corson, J.C. Kaighin	J.A. Mercer	Shell Ship Management Ltd
Ravenscraig	9.12.87	M.B. Bradley	R. Whyte, L.P. Bridges, A.R. Hellyer	P. White	Ropner Management Ltd
Red Sea Endeavour	16.12.87	E. Seidl	W. Kunz, F. Bausenbach, K. Hering	M. Seifert	Hargreaves Shipping Ltd
Reefer Jambu	16.4.87	B. Austen-Smith	A.E. Hamill, Li Tong Chun, Hong Tai Lin	Aung Thien	Sembawang Shipping Co. (Pte) Ltd
Reefer Manggis	17.4.86	C.F. Campbell	Rogelio A. Cabral, A. Bridger	S. Michael Dee	Sembawang Shipping Co. (Pte) Ltd

Selected and Supplementary Ships *(contd)*

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Reefer Nangka	10.9.85	I.Y. Batley	Gwee Chwee Kim, M.J. Winterbottom, Chong Chee Meng	Lim Soo Hock	Sembawang Shipping Co. (Pte) Ltd
Regina Oldendorff	23.6.87	R. Wahi	J. Reed, B. Fernandes	E.N. O'Driscoll	Egon Oldendorff (H.K.) Ltd
Remuera Bay	18.2.88	A.A. Railton	J.M. Dodworth, A.C.W. Lipscombe, D.C. Collins-Williams	W.H. Coventry	P. & O. Containers Ltd
Repulse Bay	24.6.87	C.M. Satapathy	R.S. Anand, S.S. Nair, N.S. Hardy	P.K. Basu	Ocean Transportation S.A.
Researcher	30.9.87				Gardline Shipping Ltd
Resolution	21.5.87	L.M. Wigmore	J.W. Renson, A.J. Rawlinson		Gardline Shipping Ltd
Resolution Bay	9.2.88	J.H. Hutson	D.K. MacCorquodale, N.M.V. Salmon, C.R. Merry	E. MacKenzie	P. & O. Containers Ltd
Retriever	24.5.83	A. Venables	P.M. Swan, R.C. Phillips, J. Creach	D. Steel	Cable & Wireless P.L.C.
Richfield	14.3.88	A. Scarratt	M.J. Walker, D.G. Roberts, T.P. Gunanayagam	G. Robinson	Buries Markes (Ship Management) Ltd
Rimula	7.3.88	N. Dixon	A.D. Guillaume, C.R. Love, M.E. Sutherland	M. Pearson	Shell Ship Management Ltd
Rocknes	28.5.86	M. Meyer	R.K. Ward, A.R. Farthing, S.H. Barnet	P. Popple	Jebsens Ship Management Ltd
Rollnes	11.2.88	A. Falconer	L.J. MacDonald, M.A.W. Brown	D.A. Logan	Jebsens Ship Management Ltd
Royal Princess	25.2.85	J.R. Young	N.P. Jenkins, J.A. Smith, J.A. Croft	W.J. Smith	P. & O. Lines Ltd
Rubens	11.11.87	M. Gater	A. Watkins, E. Miles, V.A. Egan	M.G. Finn	Bolton Maritime Management Ltd
Sachem	29.1.88	T.J. King	C. Kelly, H. Girst, M. Stronge	R.C. Earle	Mobil Shipping & Transportation Co.
Sagacity	23.11.84	W.M. Shireff	H.R. Beisly, R. Volante		F.T. Everard & Sons Ltd
St Clair	9.2.88	D.C. Gray	G. Gove, A.C.N. Wedge, J.S. Duncan	P.C.A. Enrico	P. & O. Ferries Ltd
St Helena	8.1.88	M.L.M. Smith	N. Case, S.B. Quinn, M. Bray	N. Abbott	Curnow Shipping Ltd
St Nicholas	13.11.86	D. Jarvis	K.B. Leech, C. Winterton, L.O.R. Roskell	R. Mallett	Sealink (U.K.) Ltd
Salmonpool	15.10.86	R. Copeland	D. Lundy, S. Honey, L. Bridges	D. Bullard	Ropner Management Ltd
San Lorenzo	30.6.87	H.A. Ross	J. Fletcher, A. Graveson, E.V. Neale	J. Hussey	Canadian Pacific Steamships Ltd
Santa Marta	7.3.88	C.W. Harvey	D.P. Trinidad, R.G. Aredonia, W. Vito	O. Viado	Denholm Ship Management Ltd
Santos Star	23.9.87	C. Bufton	R. Fitton, P. Buckley, A.M. Lee	I.C. Petrie	Blue Star Ship Management Ltd
Scamper Universal	4.6.86	D. Forster	M. Murrison, D. Winsor, R. Hutchinson	G.R. Rudd	Gateway Shipping Ltd
Scirocco	*				Denholm Ship Management Ltd
Scotia	3.3.82	G.M. Coull	J.E. Bannister, W.H. Laws, D. Dixon	J. Steven	Dept. of Agr. & Fish. for Scotland
Scottish Star	19.2.88	R.K. Bilton	G. Rawding, F.K. Robertson, M.N. Mace	H. Moran	Blue Star Ship Management Ltd
Sea Princess	13.1.88	S.W. Townsend	F.S. Greenfield, S. West, A. Hayward	G. Chapman	P. & O. Lines Ltd
Sea Searcher	4.9.87	L.M. Wigmore	T.D. Childs, A.J. Rawlinson (Mrs)		Gardline Shipping Ltd
Seaboard Illustrious	6.11.84	J. Gillies	R. Crawford, A.F. Vincent, A.G. Maclean	C. Thompson	Seaboard Offshore Ltd
Seaboard Implacable	24.4.87	J.R. Brooks	D.J. MacLellan, F.W. Wilson, D.J. Massey		Seaboard Offshore Ltd
Seaboard Invincible	25.2.86	A.F. Vincent			Seaboard Offshore Ltd
Seagair	5.2.88	F.W. Hammond	C.S. Adams, J.D. Cawsey, A.L. Zambon	J. Cameron	B.P. (Pet. Dev.) Ltd
Semac 1	28.8.80	J. Dobeson			Semac Services Ltd
Shell Explorer	29.2.88	D.M. Burn	J.M.G. Arthur, D. Lakeman, R. Seymour		Shell (U.K.) Ltd
Shetland Service	18.1.88	P.C. Dyer	K.M. Keith, D.E. Grief, M. Hooson		Zapata Offshore Marine Ltd
Silver Tower	*	R.B. Hughes	I.Y. Juwale, J.H. Clamp, S.W. MacDonald	A.T. Cumming	Wallem S.M.S. (I.O.M.) Ltd
Singapore Senator	5.2.88	M. Jordan	C.S. Kalra	S. Nissim	Canadian Pacific Steamships Ltd

Sir Alexander Glen	26.1.88	D. Willey	W.G. Wood, P.P. Jonsson, D.T. Nichol	N.H. Read	Hudson S.S. Co. Ltd
Sky Clipper	26.10.87	J. Sturgess	E.R. Bruce, C.A. Coutinho, P. Rishi	M.V. Rosario	E. & F. Shipping Management Ltd
Snow Crystal	2.9.87	W.G. Lockie	J.A. Freegard, C.M. Spurling, S.G. Fraser	J.H. Williams	Wallem S.M.S. (I.O.M.) Ltd
Snow Flower	1.2.88	M. Baker	J.A. Freegard, I. Craig, R.J. Murray	B. Neary	Wallem S.S. (I.O.M.) Ltd
Sociality	*	T. Hooper	B. McNally, J. Millard		F.T. Everard & Sons Ltd
Sonia M.	24.3.87	J. Pearsall	G.P. Eyles, G. Connick, M. Cox	E. Bromham	Cardiff Ship Management Ltd
South Venture	*	C. D'Souza	S. Mohan, P. Kumar, P. Fonseca		South Venture Shipping Ltd
Southland Star	21.3.88	P.W. Hutchinson	G. Warley, N. Wright, P.A. Own	D.K. Iveson	Blue Star Ship Management Ltd
Speciality	27.2.85	C.T. Marchant	K. Lindsay, S.K. Campbell, S. Richardson		F.T. Everard & Sons Ltd
Stability	9.10.87	R.G. Davis	C.D. Spencer-Payne, M.W.T. McDowell, I.R. Cameron		F.T. Everard & Sons Ltd
Staffordshire	8.1.88	P.S. Bytheway	R. Gillett, D. Cramer, P. Ashhurst	I. Forster	Bibby Line Ltd
Stainless Spray	16.3.88	J.H. Hirst	B. Stevenson, M.S. Chabba, J.W. Mampilly	J. McFarland	Turnbull Scott Management Ltd
Star World	7.8.87	C.M.R. Lloyd	R.M. Patmore, M.M. Varaudekar, G.A. Chhugani	P.T. Vaidya	Marine Navigation Co. Ltd
Starella	22.12.87	J.B. Nichols	P. Musgrave, M.S. Kelly		J. Marr & Son Ltd
Stellaman	17.2.87	S. Scott	M. Abbott, P.J. Wilkinson, J.H. Bates		Rowbotham Tankships Ltd
Stena Britannica	7.7.87	N.B. Le Pine Williams	H.N.P. Aplin, A.S. Evitt, P. Appleford	P. Skidmore	Northern Marine Management Ltd
Stena Carrier	*	N.B. Le Pine Williams	C. Atterton, G. Gardiner, J. Dyson	R. Clayton	Northern Marine Management Ltd
Stena Oceanica	16.12.87	F.R.N. Best	I. Roberts, R.T. Nield, I.M. Whiting	J. Marquess	Northern Marine Management Ltd
Stena Seawell	3.3.88	M. Williams	K. Summers, I.M. Stewart, G. Bradley	S. Ainsworth	Stena Ltd
Stolt Sceptre	11.8.87	F. Perrin	D. Yorke, D. Mulhern, M. McGlone	R. Bradwell	Wallem S.M.S. (I.O.M.) Ltd
Stolt Stane	7.3.88	K.V. Lewis	P.A. Southworth, A.F. McFee, C. Beaton	R.P. Bradsell	Wallem S.M.S. (I.O.M.) Ltd
Stolt Surf	31.7.87	B.F. Hoare	P. Papangelo, C. Saberon	R. Bonus	Stolt-Nielsen Inc.
Stolt Templar	21.3.88	A.G. Rothery	I.R. Simpson, D.M. Hopkin	A.R. Watt	Wallem S.M.S. (I.O.M.) Ltd
Strathbrora	14.3.88	B. Cushman	M. Watts, D. Lewis, M.C.P. Sutcliffe	V. Gorny	P. & O. Containers Ltd
Strathconon	29.2.88	K.J. Owen	D.J. Bailey, A. Lewis, E.P. Mullan	D.A. Kelsall	P. & O. Containers Ltd
Strider Juno	18.2.88	R. Forsyth	W.D. Garcia, W.A. Santos, R.A. Lora	M. Fancisco	Sea Containers Chartering Ltd
Suilven	21.8.87	A.C. Free	M. MacLeod, C. Campbell, A. Morrison	W. Thomson	Caledonian MacBrayne Ltd
Sulisker	17.12.87	D.K. Dickson	J.C. Barton, R.J. Sheldon, A.S.T. Beveridge		Dept of Agr. & Fish. for Scotland
Sumburgh Head	*	J.A. Pretswell	A. Todd, Z. Greber		Chr. Salvesen Shipping Ltd
Sun Suma	29.2.88	D. MacKinnon	S. Prabhakar, L.T. Richards, Chan Ping Fai	M.L. Kershaw	Vermilion Overseas Mgmt. Ltd
Swift Trader	24.11.87	S. Pollock	H.H. Gale, W. Runcie, R.J. Taylor		International Chartering Ltd
Taian	9.2.88	A. Evans	R. Sekar, T.R. Patnaik, U. Sinha	A.A. Bawade	Lyle Ship Mgmt Ltd
Taiwan Senator	7.1.87	B. Dyson	S.J. Darling, A. Ashurst, K. Ball	O. Geraghty	Furness Withy (Shipping) Ltd
Tankerman	9.12.86	R.G. Burnet	J.M. Walker, H.J. Pearce, D.A. Jackson	P. Kelly	Rowbotham Tankships Ltd
Telnes	15.8.86	D. Clements	D. Lloyd, M. Bailey	J. O'Driscoll	Jebsens Ship Management Ltd
Texaco Westminster	6.4.87	J.R. Walker	J.B. Anderson	P.J. Kilbane	Texaco Overseas Tankships Ltd
Texaco Windsor	3.2.87	D.J. Vann	P.A. Hughes, E.M. Bower	T.J. Bailey	Texaco Overseas Tankships Ltd
Tokyo Bay	21.3.88	C.R. Short	P. Johnson, L.J. Fletcher, S.J. Edge	D. Millar	P. & O. Containers Ltd
Tolaga Bay	15.2.88	R.P. Royan	P.A.E. Sambrook, I.M. Hill, C.J. Batty	B.G. Wilkinson	P. & O. Containers Ltd
Tor Bay	18.2.88	D.P. Worsnip	T.G. Whittaker, N. Leamann-Taylor, G.N. Hale	D.S. Flemington	P. & O. Containers Ltd
Tor Caledonia	12.7.85	A.I. Scott	G. Lockwood	G. MacKecknie	Denholm Ship Management Ltd
Tribulus	18.2.88	G.P. Porter	A.J.M. Leach, B.D. Carty, S.J. Vaughan	M.A. Kadir	Shell Ship Management Ltd
Tricula	21.1.88	M. Ayech	T.J. Lant, A.N. Anderson, A.J. Skingley	A. Bellamy	Shell Ship Management Ltd
Trinidad and Tobago	29.2.88	D.C.S. Farquhar	K.M. Duncan, A.G. Gordon, P.W. Anthony	W.R. Ormrod	Bibby Line Ltd
Unique Carrier II	*	M. Kalia	R. Khanna, -. Mandal, -. Goswami	S. Chadiali	Unique Shipping Agencies Ltd
Valdivia	22.1.88	N.C. Kerr	M.D. Eckersley, J. MacLennon Craig	P.S.G. Hannon	Harrison (Clyde) Ltd

Selected and Supplementary Ships *(contd)*

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Venassa	16.11.87	J.L. Taylor	N. Barningham, P. Razey, P. Hancock	V. Haidak	Shell Ship Management Ltd
Vic Bilh	13.1.88	N. Greig	T.C. Cullen, L.G. Hosick, T.A. Butten	A.C. Harris	Fairfield-Maxwell Services
Victoria Peak	23.2.88	J. Morecroft	P.T. Clegg, P.N.W. Collings, A.P. Gillen	A. Fasih	Seahorse Ship Management Ltd
Victus	18.1.88	P.K. Sen	B.S. Grewal, T.D. Pavri, A.M. Cooper	O.E. Noronha	Barber Ship Management Ltd
Vigilant	4.1.87	D.L. Rattray	C.G.M. Dale, A.R. Davison, D.W. Temple		Dept of Agr. & Fish for Scotland
Viking Valiant	27.10.87	R.A. Shopland	R.A. Berry, P.G. Williams	G.I. Petrie	P. & O. Ferries Ltd
Viking Venturer	9.12.87	C.E. Banks	D.J. Pearce, A.J. Gorringe, L.T. Simpson		P. & O. Ferries Ltd
Viking Viscount	1.12.87	M. Edward	M.L. Bechley, J.R. Warton, P.A. Marcon	B.C. Bull	P. & O. Ferries Ltd
Viking Voyager	7.1.88	C. Walford	D.A. Parsons, P.D. Meyerhoff, S. Townsend		P. & O. Ferries Ltd
Vivian M	18.2.88	R.N. Cumbers	W.J. Harwood, R. Avasthy, S.K. Das	V.A. Shete	E. & F. Shipping Management Ltd
W.A. Mather	19.8.87	B.P. Philip	R.L. Smith, G.P. Chapman, D. Knights	P.D. Hartwell	Canadian Pacific Steamships Ltd
Washington	12.8.87	J.N. Ramsey	J. Wilson, K. Whittaker, D.D. Matheson	K. Whytock	Stephenson Clarke Shipping Ltd
Wellington Star	11.1.88	T.C. Black	P.C. French, D.A. Parsons, G.A. Hoe-Richardson	G.E.J. Bailey	Blue Star Ship Management Ltd
Westmoor	4.1.87	D.J. Lloyd	M.G. Hancock, A.C. Dunnings		Denholm Ship Management Ltd
Westfield	*	G. Clifford	P. Karunasundera, M. Bingham, R.W.A. Brough	B.C. Vantwest	Buries Markes & Co. Ltd
Westra	6.1.83	T. Henderson	D.L. Beveridge, R.J. Sheldon		Dept of Agr. & Fish. for Scotland
Wheelsman	17.11.86	P.J. Jameson	J. Whitford	A.F. Clifford	Rowbotham Tankships Ltd
Willowbank	7.3.88	P. Simpson	P.G.H. Stapleton, P.N. Hill, G.W. Farrant	I.R. Shaw	Bank Line Ltd

'Marid' Ships

The following is a list of ships recruited for the observing and reporting of sea temperatures from the coastal waters of Great Britain. Masters are requested to point out any errors or omissions from the lists.

Name of Vessel	Master	Owners/ Manager
Arco Thames	P.H. Phillips	A.R.C. (Marine) Ltd
Ashington	M. Rushbrook	Stephenson Clarke Shipping Ltd
Authenticity	F. Watson	F.T. Everard & Sons Ltd
B.P. Jouster	J.M. Kane	B.P. Oil Ltd
B.P. Warrior	A.P.C. Hill	B.P. Oil Ltd
Barra Head	R.A. Brown	Christian Salvesen (Shipping) Ltd
Bowcross	A. Agius	British Dredging Aggregates Ltd
Bude	T. Moran	Bowker & King Ltd
Clymene	E.A. Jones	Furness Withy (Shipping) Ltd
Columba	R. Hutcheson	Caledonian MacBrayne Ltd
Craigallian	P.J. Flynn	J. & A. Gardner Ltd
Eastgate	A.P. Shenton	Rowbotham Tankships Ltd
Emerald	P.R. Thompson	Stephenson Clarke Shipping Ltd
Esso Avon	T. Davies	Esso Petroleum Co. Ltd
Esso Clyde	D.M. Campbell	Esso Petroleum Co. Ltd
Esso Fawley	K. Lightboy	Esso Petroleum Co. Ltd
Esso Mersey	J.H. Smith	Esso Petroleum Co. Ltd
Esso Milford Haven	D.W. Ling	Esso Petroleum Co. Ltd
Esso Plymouth	J. Evans	Esso Petroleum Co. Ltd
Esso Tenby	D. Petvin	Esso Petroleum Co. Ltd
Frederick M	R.G. Vine	Coe-Metcalf Shipping Ltd
Gladonia	L. Edwards	Runwave Ltd
Harting	M. Chorazewski	Stephenson Clarke Shipping Ltd
Helmsman	F. Craske	Rowbotham Tankships Ltd
Hoveringham I	H.J. Pope	United Marine Dredgers Ltd
Irishgate	R. Samson	Rowbotham Tankships Ltd
Jubilence	I.C. Williams	Crescent Shipping Ltd
Kindrence	A.J. Affleck	Crescent Shipping Ltd
La Colina	A. Scarratt	Buries Markes (Ship Management) Ltd
La Hacienda	F. Frisby	Buries Markes (Ship Management) Ltd
La Predera	M.C. Bowen	Buries Markes (Ship Management) Ltd
Malling	R. Clifford	Stephenson Clarke Shipping Ltd
Militence	D.A. Hadfield	Crescent Shipping Ltd
North Venture	B.W. Firth	Silver Line Ltd
Northgate	K. Blacker	Rowbotham Tankships Ltd
Oilman	S. Mahoney	Rowbotham Tankships Ltd
Orionman	A.W. Duffin	Rowbotham Tankships Ltd
Piquence	A. Affleck	Crescent Shipping Ltd
Rora Head	P.J. Keane	Christian Salvesen (Shipping) Ltd
St Brendan	P. Evans	Sealink (U.K.) Ltd
St Columba	L.R. Evans	Sealink (U.K.) Ltd
Shell Craftsman	M. Fraser	Shell (U.K.) Oil Ltd
Shell Trader	D. McLindon	Shell (U.K.) Oil Ltd
Storrington	W. McNaughton	Stephenson Clarke Shipping Ltd
Vibrence	J. Setterfield	Crescent Shipping Co. Ltd
Warden Point	S. Sutherland	Hudson S.S. Co. Ltd

Light-vessels

Name of Vessel	Master
Channel	A. Fowler, P. Newland
Dowsing	J. Kirkland, J. Akester
Humber	P.L. Wilkins, P.F.J. Hollowey
Royal Sovereign (Lt Tower)	V.S. Pearce, P. Stafford
St. Gowan	F. Edwards, W. Sheaf
Smith's Knoll	G.E. West, C.E. Woods

Oil Rigs and Platforms

Name of Rig or Platform	Owners/Operators
Beatrice A	Britoil P.L.C.
Benlomond	Atlantic Drilling Co. Ltd
Benvreoch	Atlantic Drilling Co. Ltd
Benvrackie	Atlantic Drilling Co. Ltd
Beryl B	Mobil North Sea Ltd
Clyde A	Britoil P.L.C.
Deep Sea Pioneer	Hamilton Brothers Oil & Gas Ltd
Dixilyn Field 96	Sonat Offshore Ltd
Dixilyn Field 97	Sonat Offshore Ltd
Dunlin A	Shell U.K. Exploration & Production Ltd
F.G. McClintock	Reading & Bates Ltd
Glomar Arctic 3	Global Marine Ltd
Heather A	Unionoil Co. of G.B. Ltd
M.G. Hulme Jnr	Reading & Bates Ltd
Montrose A	Amoco (U.K.) Exploration Ltd
Morecombe Bay (API)	Hydrocarbons (G.B.) Ltd
Santa Fe 140	Santa Fe (U.K.) Ltd
Sea Explorer	B.P. Pet. Development Ltd
Sedneth 701	Sedco-Forex
Thistle A	Britoil P.L.C.
Western Pacesetter IV	Western Oceanic (U.K.) Ltd

BRITISH COMMONWEALTH

The following lists give the names of Selected and Supplementary Ships, and the number of Auxiliary Ships where known (i.e., those which only report in 'sparse areas'), which voluntarily co-operate with meteorological services of the British Commonwealth
Information for these lists is required by 31 March each year. Information for the January corrective lists is required by 30 September each year.

AUSTRALIA (Information dated 5.2.88)

Name of Vessel	Owners/Manager
Selected Ships:	
Abel Tasman	Govt of the State of Tasmania
Al Khaleej	Livestock Transport & Trading Co. K.S.C.
Al Qurain	Livestock Transport & Trading Co. K.S.C.
Al Shuwaikh	Livestock Transport & Trading Co. K.S.C.
Al Yasrah	Livestock Transport & Trading Co. K.S.C.
Anro Australia	Australian National Line
Arafura	Eastern & Australian S.S. Co. (M.S.) Pty Ltd
Ariake I	Eastern & Australian S.S. Co. (M.S.) Pty Ltd
Arwa	Yemen Ports and Shipping Corp.
Australia Star	Blue Star Ship Management Ltd
Australian Escort	Australian National Line
Australian Exporter	Australian National Line
Australian Progress	Australian National Line
Australian Prospector	Australian National Line
Australian Purpose	Australian National Line
Australian Spirit	B.P. Australia Ltd
Australian Trader	Australian National Line
Australian Venture	Australian National Line
B.P. Achiever	B.P. Australia Ltd
B.P. Enterprise	B.P. Australia Ltd
Bass Trader	Australian National Line
Buffalo Express	Vroon B.V. Breskens
Canopus	Howard Smith Industries Pty Ltd
Cape Don	Department of Transport
Cape Moreton	Department of Transport
Cape Pillar	Department of Transport
Coral Chief	China Nav. Co. Ltd
Danny F	Norleb Shipping Enterprises S.A.R.L.
Eigamoiya	Nauru Local Govt Council
Eigigu	Nauru Local Govt Council
El Cordero	Cugado Shipping Co. S.A.
El Redil	Italcattle S.p.A.
Energy Searcher	Socal Chartering Pty Ltd
Fernanda F	Oceanic Shipping S.A.R.L.
Flamingo Bay	
Flinders Range	Australian National Line
Franklin	C.S.I.R.O.
Fua Kavenga	Govt of the Kingdom of Tonga
Hanne Bakke II	Knutsen Offshore (Panama) S.A.
Howard Smith	Howard Smith Industries Pty Ltd
Icebird	Partenreederei m.s. Icebird
Ilongo	Borgships Inc.
Irene Greenwood	Stateships
Iron Arnhem	Broken Hill Pty Co. Ltd
Iron Capricorn	Broken Hill Pty Co. Ltd
Iron Kestrel	Ropner Shipping Co. Ltd
Iron Kirby	Ropner Shipping Co. Ltd
Iron Sturt	Bulkships Finance Pty Ltd
Island Gas	Broken Hill Pty Co. Ltd
Jabiru Venture	Broken Hill Pty Co. Ltd
Klang Reefer	Sea Management Services Hong Kong
Koolinda	Stateships
Kowulka	C.S.R. Ltd
Lindesay Clark	Howard Smith Industries Pty Ltd
Mawashi Al-Gasseem	Saudi Livestock Transport & Trading Co.
Melbourne Trader	Australian National Line
Mobil Flinders	Mobil Oil Australia Ltd
Nella Dan	J. Lauritzen A/S
Nimos	China Nav. Co. Ltd
Nivosa	Shell Co. of Australia Ltd
Ormiston	C.S.R. Ltd
Papuan Chief	China Nav. Co. Ltd

Australia *(contd)*

Name of Vessel	Owners/Manager
Pathfinder II	Pan-Ore Transportation Inc.
Pilbara	Stateships
Rig Seismic	Galerace Ltd
River Boyne	Australian National Line
River Embley	Australian National Line
River Torrens	Australian National Line
Sahiwal Express	Vroon B.V. Breskens
Seaway Hobart	Union S.S. Co. N.Z. Ltd
Siba Queen	SIBA S.P.A.
Sid McGrath	John Burke Shipping
Soela	K.F.V. Fisheries (Queensland) Pty Ltd
Swan Reefer	EAC Ship Management Services
TNT Altrans	T.N.T. Bulkships Ltd
TNT Capricornia	T.N.T. Bulkships Ltd
TNT Carpentaria	T.N.T. Bulkships Ltd
Tourcoing	Wilh. Wilhelmsen Ltd A/S
Troubridge	Govt of State of South Australia
Uniceb	Livestock Carriers S.p.A.
United Spirit	World Select Shipping Ltd
Wyuna	Australian Maritime College
Supplementary Ships:	
Iron Carpentaria	Broken Hill Pty Co. Ltd
Iron Curtis	Broken Hill Pty Co. Ltd
Iron Kembla	Broken Hill Pty Co. Ltd
Iron Monarch	Broken Hill Pty Co. Ltd
Iron Newcastle	Broken Hill Pty Co. Ltd
Iron Pacific	Broken Hill Pty Co. Ltd
Iron Prince	Broken Hill Pty Co. Ltd
Iron Shortland	Broken Hill Pty Co. Ltd
Iron Spencer	Broken Hill Pty Co. Ltd
Iron Whyalla	Broken Hill Pty Co. Ltd
Neptune Seginus	Neptune Orient Lines

Auxiliary Ships:
Australia has 3 Auxiliary Ships currently reporting.

CANADA (Information dated 1.1.88)

Name of Vessel	Owners/Manager
Ad Astra	Barber Ship Management Ltd
Advent	Government of Canada
Alberni Dawn	Man Cheung Yuen Services Ltd
Alert	Government of Canada
Ann Harvey	Canadian Coast Guard
Arctic	Canarctic Shipping Co. Ltd
Astron	Tarros Ventures (NFLD) Ltd
Atlantic Wing	Act Maritime Co. Ltd
Baffin	Government of Canada
Bartlett	Canadian Coast Guard
Bayfield	Government of Canada
Beiner	Marine Institute of Newfoundland
Bergen Arrow	Jardine Ship Management Ltd
Bibi	Sir William Reardon Smith & Sons Ltd
Bluenose	Canadian National (Marine)
Bow Drill 3	Husky/Bow Valley Offshore Drilling Ltd
Brandal	Karlson Shipping Co. Ltd
Brierfield	Buries Markes (Ship Management) Ltd
Bunga Kantan	Malaysian International Shipping Corp.
Camsell	Government of Canada
Canadian Ace	Montreal Shipping Ltd
Cape Brier	Government of Canada
Cape Roger	Government of Canada
Chebucto	Government of Canada
Chennai Nermai	South India Shipping Corp. Ltd
Citadel Hill	Barber Ship Management Ltd

Canada *(contd)*

Name of Vessel	Owners/Manager
Coastal Canada	Greater Sarnia Investment Corp.
Cygnus	Government of Canada
Dawson	Government of Canada
Des Groseillers	Canadian Coast Guard
Earl Gray	Government of Canada
Eastern Maid	Indo-China S.N. Co. Ltd
Egda	Indo-China S.N. Co. Ltd
Edward Cornwallis	Government of Canada
F.C.G. Smith	Government of Canada
Fort Calgary	Canadian Pacific Steamships Ltd
Fort Kamloops	Canadian Pacific Steamships Ltd
Fort Nanaimo	Canadian Pacific Steamships Ltd
Fort Nelson	Canadian Pacific Steamships Ltd
Fort Yale	Canadian Pacific Steamships Ltd
F.P. Clipper	East Asiatic Co. Ltd
Friendship	Friendship Carrier Inc.
Fuhwo Venture	Indo-China S.N. Co. Ltd
G.B. Reed	Government of Canada
George E. Darby	Government of Canada
George R. Pearkes	Government of Canada
Great Jade	World-wide Shipping Agency Ltd
Great Pearl	World-wide Shipping Agency Ltd
Great Prize	Wak Tung Shipping Co. Ltd
Grena	Jardine Ship Management Ltd
Harmac Dawn	Man Cheung Yuen Services Ltd
Hudson	Government of Canada
Irving Arctic	Kent Lines Ltd
Irving Canada	Kent Lines Ltd
Irving Eskimo	Kent Lines Ltd
Irving Forest	Kent Lines Ltd
Irving Ocean	Kent Lines Ltd
Island Princess	P. & O. Lines Ltd
J.C. Phillips	Soconav. Inc.
J.E. Bernier	Government of Canada
Jackman	Government of Canada
James Sinclair	Government of Canada
Jean Paquin	Logistic Navigation Co. Ltd
John A. Macdonald	Canadian Coast Guard
John Cabot	Government of Canada
John P. Tulley	Government of Canada
Kemano Saga	Jardine Ship Management Ltd
Leonard J. Cowley	Government of Canada
Limnos	Government of Canada
Loftnes	Jebsen Ship Management Ltd
Louis M. Lauzier	Navmar Corp.
Louis S. St Laurent	Canadian Coast Guard
Louisburg	Government of Canada
Lucien Paquin	Logistic Navigation Co. Ltd
Martha L. Black	Government of Canada
Mary Hichens	Government of Canada
Maxwell	Government of Canada
Nahidik	Government of Canada
Namao	Government of Canada
Nandu Arrow	Jardine Ship Management Ltd
New Zealand Alliance	Shipping Corporation of N.Z.
Nordglimt	Norden Steamship Co. Ltd
Nordkap	Norden Steamship Co. Ltd
Nordkyn	Norden Steamship Co. Ltd
Norman McLeod Rogers	Canadian Coast Guard
Pacific Princess	P. & O. Lines Ltd
Pandora II	Government of Canada
Panther	Unique Shipping Agencies Ltd
Parizeau	Government of Canada
Pierre Radisson	Canadian Coast Guard
Practician	Ocean Tramping Co. Ltd
Princess of Acadia	Canadian National (Marine)
Queen of Prince Rupert	British Columbia Ferries
Queen of the North	British Columbia Ferries
Raven Arrow	Indo-China S.N. Co. Ltd
Rimba Maranti	Malaysian International Shipping Corp.
Rowan Gorilla I	Rowan Companies Ltd

Canada *(contd)*

Name of Vessel	Owners/ Manager
Royal Princess	P. & O. Lines Ltd
Sedco 710	Petro Canada
Simon Fraser	Government of Canada
Sir Humphrey Gilbert	Canadian Coast Guard
Sir James Douglas	Government of Canada
Sir John Franklin	Canadian Coast Guard
Sir Wilfred Grenfell	Canadian Coast Guard
Sir Wilfred Laurier	Canadian Coast Guard
Sir William Alexander	Government of Canada
Skeena	Reardon Smith Lines Ltd
Star Everwin	Man Cheung Yuen Services Ltd
Star Florida	Univan Ship Management Co. Ltd
Star Hong Kong	World-wide Shipping Co. Ltd
Star Magnate	Marine Navigation Co. Ltd
Summerfield	Buries Markes (Ship Management) Ltd
Sun Maya	Fuji Shipping Co. Ltd
Sun Princess	P. & O. Lines Ltd
Sun Rokko	Gearbulk Shipping Agency Ltd
Star Sulu	Vinta Maritime Co. Ltd
T. Akasaka	Canadian Pacific Steamships Ltd
Tanu	Government of Canada
Thomas Carleton	Government of Canada
Thor I	Thor Dahl Lines
Thorscape	Thor Dahl Lines
Trudy	Souter Shipping Ltd
Tsekoa II	Government of Canada
Tupper	Government of Canada
United Drive	International United Shipping Agency Ltd
Western Valley	Reardon Smith Lines Ltd
W.E. Ricker	Government of Canada
Wilfred Templeman	Government of Canada
William	Government of Canada

Auxiliary Ships:

Canada has 255 ocean-going Auxiliary Ships and 114 Auxiliary Ships operating on the Great Lakes and Inland Waters.

HONG KONG (Information dated 15.3.88)

Name of Vessel	Owners/ Manager
Selected Ships:	
Acacia	Mercury Shipping Co. Ltd
Als Harmony	Ahrenkiel Liner Service (H.K.) Ltd
Als Reliance	Ahrenkiel Liner Service (H.K.) Ltd
Asian Jade	Swire Shipping (Agencies) Ltd
Asian Pearl	Swire Shipping (Agencies) Ltd
Asian Thistle	Island Navigation Corp. Inter. Ltd
Barber Perseus	Barber Wilhelmsen Agencies Ltd
Barber Tampa	Barber Wilhelmsen Agencies Ltd
Boonkrong II	Chin Seng Hong Ltd
Bunga Kantan	Mak Shui Cho & Son Ltd
Bunga Suria	Mak Shui Cho & Son Ltd
C.R. Abidjan	Wallem Shipping (H.K.) Ltd
C.R. Douala	Wallem Shipping (H.K.) Ltd
C.R. Pointe Noire	Wallem Shipping (H.K.) Ltd
Castle Peak	Blue Star Ship Management Ltd
Chengtu	Swire Shipping (Agencies) Ltd
Coral Princess	Swire Shipping (Agencies) Ltd
Feoso Ambassador II	Feoso Maritime Ltd
Gonosan	Unique Shipping Agencies Ltd
Halldor	Thoresen Ship Management Ltd
Hawk Arrow	Indo-China S.N. Co. (H.K.) Ltd
Hong Kong Container	Island Navigation Corp. Inter. Ltd
Jebsen Tauranga	Kristian Jebsens Ltd
Kweilin	Swire Shipping (Agencies) Ltd
Mah IV	Chin Seng Hong Ltd
Maritime Bravery	International Maritime Carriers Ltd

Hong Kong *(contd)*

Name of Vessel	Owners/Manager
Maritime Champion	International Maritime Carriers Ltd
Maritime Express	International Maritime Carriers Ltd
Maritime Gardenia	International Maritime Carriers Ltd
Maritime Goliath	International Maritime Carriers Ltd
Maritime Joy	International Maritime Carriers Ltd
Maritime Noble	International Maritime Carriers Ltd
Maritime Star	International Maritime Carriers Ltd
Maritime Wisdom	International Maritime Carriers Ltd
Morning Grace	Wing Tak Shipping Agency Ltd
Musing	Ocean Tramping Co. Ltd
New Oasis	Wing Tak Shipping Agency Ltd
Noble Star	Barber Ship Management Ltd
Ocean Container	Miltrend Shipping Ltd
Ocean Elite	Wing Tak Shipping Agency Ltd
Ocean Pearl	Pearl Cruises Catering (H.K.) Ltd
Ocean Sincerity	Wing Tak Shipping Agency Ltd
Ocean Strength	Wing Tak Shipping Agency Ltd
Oriental Ambassador	Island Navigation Corp. Inter. Ltd
Oriental Chief	Island Navigation Corp. Inter. Ltd
Oriental Expert	Island Navigation Corp. Inter. Ltd
Oriental Explorer	Orient Overseas Container Line Ltd
Oriental Fair	Orient Overseas Container Line Ltd
Oriental Faith	Orient Overseas Container Line Ltd
Oriental Fortune	Orient Overseas Container Line Ltd
Oriental Freedom	Island Navigation Corp. Inter. Ltd
Oriental Knight	Island Navigation Corp. Inter. Ltd
Oriental Patriot	Orient Overseas Container Line Ltd
Osprey Arrow	Indo-China S.N. Co. (H.K.) Ltd
Pacific Container	Miltrend Shipping Ltd
Red Sea Pioneer	Barber Ship Management Ltd
Quorn	Pentagon Shipping (H.K.) Ltd
R.R. Ratna	Orient Overseas Container Line Ltd
Raya Fortune	Ocean Tramping Co. Ltd
Raya Glory	Ocean Tramping Co. Ltd
Raya Happiness	Ocean Tramping Co. Ltd
Sea Architect	Interocean Shipping Co. Ltd
Thai Amber	Island Navigation Corp. Inter. Ltd
Thai Jade	Island Navigation Corp. Inter. Ltd
Thai Tubtim	Island Navigation Corp. Inter. Ltd
Tokyo Bridge	K-Line Kawasaki (H.K.) Ltd
Willine Taiko	Jardine Shipping Agencies (H.K.) Ltd
Yuen Chau	Miltrend Shipping Ltd
Supplementary Ships:	
Admiralty Island	Miltrend Shipping Ltd
Brooklyn Bridge	K-Line Kawasaki (H.K.) Ltd
Eriskay	The China Navigation Co. Ltd
Hallvard	Thoresen Ship Management Ltd
Hugheverett	Everett Steamship Corp. S/A
Hunan	The China Navigation Co. Ltd
Island Container	Miltrend Shipping Ltd
Jebsen Napier	Kristian Jebsens Ltd
Jebsen Timaru	Kristian Jebsens Ltd
Johneverett	Everett Steamship Corp. S/A
Kitano Maru	N.Y.K. Line (H.K.) Ltd
Manoloeverett	Everett Steamship Corp. S/A
Maritime Faith	International Maritime Carriers Ltd
Maritime Hibiscus	International Maritime Carriers Ltd
Maritime Triumph	International Maritime Carriers Ltd
Maritime Victory	International Maritime Carriers Ltd
Ngan Chau	Miltrend Shipping Ltd
Seamaster I	Interocean Shipping Co. Ltd
Silver Clipper	Valles Steamship Co. Ltd
Success Bulker	Valles Steamship Co. Ltd
Theben	Barber Ship Management Ltd
Thomaseverett	Everett Steamship Corp. S/A
World Ranger	World-wide Shipping Agency Ltd

Auxiliary Ships:

Hong Kong also has 1 Auxiliary Ship currently reporting.

NEW ZEALAND (Information dated 1.2.88)

Name of Vessel	Owners/Manager
Selected Ships:	
ACT 3	Blue Port ACT (N.Z.) Ltd
ACT 4	Blue Port ACT (N.Z.) Ltd
ACT 5	Blue Port ACT (N.Z.) Ltd
Amaltal Explorer	Amaltal Fisheries
Amokura	Union Maritime Services Ltd
Aotea	Container Fleets (N.Z.) Ltd
Auckland Express	Tasman Express Line
Canterbury Express	Tasman Express Line
Capitaine Tasman III	Sofrana Unilines
Capricornia	Polynesia Triangle Line
Cordella	Skeggs Fisheries
Cormorant Arrow	Gearbulk Shipping Ltd
Daniel Solander	Solander Fisheries Ltd
Fetu Moana	Shipping Corporation of N.Z.
Fijian	Reef Shipping Agencies
Forum New Zealand II	Pacific Forum Line
Forum Samoa	Pacific Forum Line
Golden Bay	Tarakohe Shipping Co.
Greenfield	Wallem Ship Management
Holmdale	Union Maritime Services Ltd
James Cook	N.Z. Government (Fisheries Research)
Jebsen Tauranga	Jebsen N.Z. Ltd
Kaharoa	Fisheries Research Division
Kotuku	Union Maritime Services Ltd
Kuaka	Union Maritime Services Ltd
Mandama	Blue Port ACT (N.Z.) Ltd
N.Z. Caribbean	Shipping Corporation of N.Z.
N.Z. Mariner	Shipping Corporation of N.Z.
N.Z. Pacific	Shipping Corporation of N.Z.
Pacific Ataawhai	Shell B.P. Todd Consortium
Rapuhia	DSIR/Union Maritime Services Ltd
Spirit of Competition	Pacifica Shipping Co.
Spirit of Freedom	Pacifica Shipping Co.
Taiko	Union Maritime Services Ltd
Tasman Enterprise	Union Maritime Services Ltd
Tasman Venture	Union Maritime Services Ltd
Tui Cakau III	Pacific Lines
Union Auckland	Union Maritime Services Ltd
Union Endeavour	Union Maritime Services Ltd
Union Rotoiti	Union Maritime Services Ltd
Union Rotorua	Union Maritime Services Ltd
Westport	N.Z. Cement Holdings Ltd
Supplementary Ships:	
Arahanga	New Zealand Railways
Arahura	New Zealand Railways
Aratika	New Zealand Railways

Auxiliary Ships:

New Zealand has a fleet of 12 Auxiliary Ships currently reporting.

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